

# Integrating Technology Tools Into Instruction



**What's Working in Inclusive Classrooms**





# Integrating Technology Tools into Instruction

---

WHAT'S WORKING IN INCLUSIVE CLASSROOMS

Cynthia Warger,  
Brenda Heiman,  
Madalaine Pugliese,  
and John Castellani,  
Editors



---

Copyright © 2011 by the Technology and Media Division (TAM) of the Council for Exceptional Children. [www.tamcec.org](http://www.tamcec.org)

Margaret Bausch and Melinda Ault, Co-Chairs, Publication Committee.

For ordering information, contact: Exceptional Innovations, Inc., ATT: TAM Products, P.O. Box 3853, Reston, VA 20195, 703-709-0136, [info@exinn.net](mailto:info@exinn.net), [www.exinn.net](http://www.exinn.net).  
*Note:* TAM product order forms are available on the TAM website at [www.tamcec.org](http://www.tamcec.org)



Technology and Media Division  
of the Council for Exceptional Children

---

# Table<sup>of</sup> Contents



Foreword.....	v
Chapter 1: Illustrating the Blend of Assistive and Instructional Technology Integration in Successful Inclusion Classrooms: What Competencies Does it Take? <i>Madalaine K. Pugliese</i> .....	1
Chapter 2: Making Literacy Meaningful for Everyone in Inclusive Elementary Classrooms <i>Patricia B. Weismer</i> .....	15
Chapter 3: Documenting to Support Literacy Progress: Video Recordings That Make Learning Visible <i>Gina Stefanini</i> .....	27
Chapter 4: Friendship Investigation Teams: Social Skills Training Teams That Make Learning Visible <i>Gina Stefanini</i> .....	33
Chapter 5: Technology and Web 2.0 Strategies for Executive Functioning <i>Karen Janowski</i> .....	41



# Foreword

**Brenda Heiman**

President, Technology and Media Division (TAM), Council for Exceptional Children,  
and Professor, Louisiana Tech University

*Instructional Technology (IT).*

*Assistive Technology (AT).*

*Universal Design for Learning (UDL).*

**W**hat do they mean and how in the world does it all fit together? Classroom teachers are asked on a daily basis to put all of these techniques into use, often without an understanding of the terminology much less the reasoning behind including it in their instruction and the curriculum. The purpose of this book is to make sense of all this, while describing to teachers—as well as all other members of the instructional team—practical and useful ways to provide learning tools for all students seamlessly.

Children with learning challenges benefit when teachers make accommodations in the curriculum to meet their individual needs. Technology, when used appropriately, can not only enhance a child's learning strengths, but also can accommodate learning difficulties by providing access support for skill sets that might otherwise be lost. This allows for the child to be included in the general curriculum and to participate in the classroom learning community.

For some learners, AT is the solution that allows them access to the general curriculum and access to the general classroom itself. However, we have learned that as important as that is, there are IT supports already in place in classrooms

that can provide low-cost and high-priority accommodations for a child while seamlessly integrating that child into the mainstream of the educational experience. Classroom technology supports such as interactive white boards, digital cameras, laptops, and other readily available technologies can assist in providing access to the curriculum for students with all types of diverse learning needs.

Today, many teachers are sophisticated in the use of technology tools. They are often on the forefront of demonstrating the power of technology tools to the school, the parents, and the community itself. Many schools are fortunate enough to have assistive technology specialists available to help with the integration of AT tools. AT specialists support the work of classroom teachers, providing information, tools, and strategies that help students with various learning challenges gain access to the general education curriculum. Working together, the teacher and the AT specialist, as well as all other members of the educational team, co-develop

ideas to transform AT tools into IT tools that benefit all students.

We often see, as described in this book, that the AT tools become IT tools—i.e., technology strategies that accommodate specific students' learning styles often benefit all students. Another positive outcome is that less attention is placed on the learner in need of the AT tools. Because all students have access to those tools, they ultimately become just another learning tool for everyone.

In this book, you will read about using documentation as a learning tool, about integrating Web 2.0 tools in the general education curriculum, and about making literacy meaningful across the curriculum for all students. You also will see how technology tools are being used to support students in learning social skills. You will find important information regarding standards for technology training for AT specialists, and how those standards apply to support for

students in your classroom. You will find examples and ideas for developing universally designed curriculum that support AT integration, and ultimately help us move toward technology tool integration for all students. AT, IT, and UDL will become understood and commonplace tools teachers can use to integrate students into the classroom learning environment.

The Technology and Media Division (TAM) of the Council for Exceptional Children is proud to publish this book to assist educational team members in supporting all student learning through the application of technology, whether AT, IT, or UDL. TAM's purpose has always been the support of educational participation and improved results for individuals with disabilities and diverse learning needs through appropriate use of technology. This book adheres to that mission, but goes a step further by including strategies to support all students in any educational setting.



CHAPTER  
1

# Illustrating the Blend of Assistive and Instructional Technology Integration in Successful Inclusion Classrooms:

## What Competencies Does it Take?

**Madalaine K. Pugliese**

Assistive Technology Graduate Program Director, Simmons College, Boston, MA

**I**n more than 20 years of working with graduate students in assistive technology (AT) and instructional technology (IT), I have seen how the role of assistive technology specialists in particular has changed. Assistive technology specialists are no longer called upon only to recommend physical access to the curriculum or troubleshoot a technical problem. Now they also are asked to become curriculum and strategy advisors, serving in key roles on integrated classroom teams.

Assistive technology specialists need to understand content and be able to design modifications that maintain the essence of the classroom experience for any learner, regardless of his or her challenges. The tools and strategies that they recommend must be invisible and put the student and curriculum first, resulting in a successful active learning environment.

Assistive technology/instructional technology advisors play an essential role in establishing successful inclusion environments. Today's classrooms are

Find out how assistive technology and instructional technology specialists serving on school-based teams can help establish successful inclusive environments.



filled with learners who were born into a world filled with useful tools for educators to consider when designing differentiated scaffolds to support learning opportunities. Today we all have the opportunity to carry the Internet in our pockets. Consider, for example, the need to check the spelling of a word. We could choose to turn to a print dictionary for support, but what about learners who experience challenges with using print? Instead, teaching students how to use an online dictionary provides instant access to the information—and this information is accessible to any learner who needs it. Further, when implementing these useful tools expertly, educators are using new strategies and collaborating in new ways that open doors to facilitate curriculum access for every learner.

School-based teams share expertise, combining what they understand about strategies and tools that result in more meaningful and effective practice. The purpose of this chapter is to answer key questions regarding the integration of instructional technology into an inclusive instructional program and the role of the assistive technology/instructional technology specialist on the team in supporting success. Questions include:

- What does it take for these interventions to happen successfully?
- What are the elements to consider?
- What tools are important to incorporate?

- What strategies do we need to employ?
- What competencies does the classroom team need to develop?
- What does the classroom team look like in terms of roles and responsibilities?
- How do we design learning experiences that work for everyone?

•  
**My passion as an educator  
 is to facilitate success  
 in the classroom for all  
 learners, whatever it  
 takes! It is thrilling to see  
 a diverse group of learners  
 thrive in a universally  
 accessible curriculum and  
 classroom environment.**  
 •

## About This Collection of Articles

The collection of articles in this book illustrates how technology integration can be implemented to facilitate high expectations for all children to achieve within the general curriculum. The role of assistive technology/instructional technology specialists is evolving to be more advisory or

consultative, helping to build capacity across members of school-based teams. At the same time, there has never been a more important time to facilitate ongoing classroom support and deliberately designed professional development opportunities. Because 21<sup>st</sup> century tools offer 21<sup>st</sup> century classrooms and schools a wealth of options and resources, it is important to make sure that we keep learners and the curriculum foremost in mind as we make decisions. It is not about the tools, it is about learning. It is not about technology, it is about supporting people in optimal performance. Not only does this refer to success for students, it also refers to expanding teacher capacity in meaningful ways.

In order to be successful in building school-based team capacity, it is imperative to leverage an expert set of assistive technology and instructional technology skills as a key component in the process. What are these skills and what does it look like when the skills and tools are integrated effectively? The competencies described in this context are tied to effective instruction and a strong curriculum. The goal is to make the tools seamless within the bigger picture of effective instruction, rich curriculum engagement, and successful student learning.

The authors in this collection all serve as assistive technology/instructional technology specialists who provide expertise integral to the design of successful intervention. These specialists

serve in a variety of roles and provide thoughtful models to consider. First, we will examine the competencies required for a professional skilled enough to be able to design these interventions. Next, we will examine the actual implementation of these competencies within the context of each article.

## About Assistive Technology Specialists

Assistive technology as a profession is relatively young and is still emerging. Among the earliest professional meetings on the subject was the Council for Exceptional Children's (CEC) topical conference held in 1983. Several other organizations and institutes of higher learning also have since addressed the need for developing professional knowledge and skills from a range of perspectives. [See the textbox, "Resources," for examples.] Some offer coursework (both online and face-to-face) that results in an organization-specific certification, while others offer an institution-defined graduate degree.

Qualified professionals in the role of assistive technology/instructional technology advisors or specialists might be credentialed in several ways. Certifications are typically earned from a professional organization or educational institution. It is the goal of professional associations and organizations to advance a particular occupation and facilitate the interests

of individuals engaged in that profession. They frequently require a written examination of ability or competency-based demonstration of knowledge. They also research the responsibilities of experts who are entrusted with maintaining control or overseeing of the legitimate practice of the profession. Professional organizations that award certifications also serve as the governing body for the criteria for acceptable knowledge and skills.

If there is a legal requirement to demonstrate knowledge, skill, or ability before a professional is permitted to perform a job, this is commonly referred to as licensure. A state bureau, department, or agency would typically specify the requirements for such licenses. The primary difference between a certification and a license is legal status.

Requirements for certification as an assistive technology specialist differ widely from one professional organization to the next. The same can be said for graduate degrees awarded by institutions of higher education and for the few state departments of education that have specified requirements for assistive technology specialists. Requirements—whether a written examination, an internship, a specified number of years of field experience, or contact hours in the classroom—vary widely. The textbox, "How One College

Approaches Requirements," provides an illustration.

## Assistive Technology and Instructional Technology Competencies for Successful Inclusive Classrooms

What are the fundamental knowledge and skill competencies for assistive technology/instructional technology specialists within the context of their specific role on a school-based team? Sometimes these professionals provide direct services in inclusive classrooms, working with students, teachers, and others on the team to model or explain how to use specific features or strategies. Other times they might provide support in the form of "how-to" guides, professional development, or modified curriculum materials. These professionals must leverage the seemingly limitless potential of 21<sup>st</sup> century technologies as well as understand research-based effective teaching strategies.

Nothing illustrates important new ways of thinking like stories and examples from real world implementation. Within this book are rich examples of components to look for in successful inclusive classrooms. Inclusive classrooms call for sophisticated and multifaceted approaches toward achieving learning goals for diverse learners. The authors of the

## INTEGRATING TECHNOLOGY TOOLS INTO INSTRUCTION

### Resources

#### Name

#### URL

#### Organizations and Special Projects

<b>American Foundation for the Blind (AFB)</b> Journal of Visual Impairment (August, 2009). Volume 103, Number 8 (several articles focus on assistive technology competencies)	<a href="http://www.afb.org/afbpress/pubjvib.asp?DocID=jvib0308toc">www.afb.org/afbpress/pubjvib.asp?DocID=jvib0308toc</a>
<b>American Speech-Language-Hearing Association (ASHA)</b> Knowledge and Skills for Service Delivery documents	<a href="http://www.asha.org/">www.asha.org/</a> <a href="http://search.asha.org/default.aspx?q=Knowledge%20and%20Skills%20for%20Service%20Delivery">http://search.asha.org/default.aspx?q=Knowledge%20and%20Skills%20for%20Service%20Delivery</a>
<b>Assistive Technology Outcomes Measurement System (ATOMS)/ National Institute on Disability and Rehabilitation Research (NIDRR)</b>	<a href="http://www.r2d2.uwm.edu/atoms/">www.r2d2.uwm.edu/atoms/</a>
<b>Center for Implementing Technology in Education (CITEd)</b>	<a href="http://www.cited.org/index.aspx">www.cited.org/index.aspx</a>
<b>Council for Exceptional Children (CEC)</b> Knowledge and Skills: Special Education Technology Specialists	<a href="http://www.cec.sped.org">www.cec.sped.org</a> <a href="http://www.cec.sped.org/Content/NavigationMenu/ProfessionalDevelopment/ProfessionalStandards/Special_Education_Technology_Specialist.doc">www.cec.sped.org/Content/NavigationMenu/ProfessionalDevelopment/ProfessionalStandards/Special_Education_Technology_Specialist.doc</a>
<b>National Association of State Directors of Special Education (NASDSE)</b>	<a href="http://www.cde.ca.gov/sp/se/sr/atstaff.asp">www.cde.ca.gov/sp/se/sr/atstaff.asp</a>
<b>Quality Indicators in Assistive Technology (QIAT)</b>	<a href="http://www.qiat.org">www.qiat.org</a>
<b>Rehabilitation Engineering and Assistive Technology Society of North America (RESNA)</b>	<a href="http://resna.org/">http://resna.org/</a>

#### Higher Education Certificate and Degree Programs

<b>California State at Northridge (CSUN)</b> Assistive Technology Applications Certificate Program (ATACP)	<a href="http://www.csun.edu/cod/training/index.php">www.csun.edu/cod/training/index.php</a>
<b>East Carolina University</b>	<a href="http://www.ecu.edu/cs-educ/ci/sped/at/gradcert.cfm">www.ecu.edu/cs-educ/ci/sped/at/gradcert.cfm</a>
<b>George Mason University</b> Masters in AT Certificate in AT	<a href="http://it.gse.gmu.edu/degrees/track3/">http://it.gse.gmu.edu/degrees/track3/</a> <a href="http://it.gse.gmu.edu/degrees/atc/">http://it.gse.gmu.edu/degrees/atc/</a>
<b>Johns Hopkins Center for Technology in Education</b>	<a href="http://cte.jhu.edu/">http://cte.jhu.edu/</a>
<b>Simmons College</b>	<a href="http://www.simmons.edu/gradstudies/education/academics/special/assistive.shtml">www.simmons.edu/gradstudies/education/academics/special/assistive.shtml</a>

*continued*

## Resources (continued)

Name

URL

### Higher Education Certificate and Degree Programs (continued)

<b>State University of New York (SUNY)—at Buffalo</b> Center for Assistive Technology Assistive Technology Training Online Project (ATTO)	<a href="http://atto.buffalo.edu/">http://atto.buffalo.edu/</a>
<b>University of Kentucky</b> Assistive Technology Project	<a href="http://edsrc.uky.edu/AT_Schedule.htm">http://edsrc.uky.edu/AT_Schedule.htm</a> <a href="http://edsrc.uky.edu/www/ukatii/toolkit/index.html">http://edsrc.uky.edu/www/ukatii/toolkit/index.html</a>

### Public Education and Agency Collaborations

<b>Florida Department of Education</b> Assistive Technology Assessment Competencies and Resources	<a href="http://www.florida-ese.org/atcomp/">www.florida-ese.org/atcomp/</a>
<b>Georgia Project for Assistive Technology (GPAT)</b>	<a href="http://www.gpat.org/">www.gpat.org/</a>
<b>Maryland Assistive Technology Network (MATN)</b>	<a href="http://www.matnonline.com/9515">www.matnonline.com/9515</a>
<b>Minnesota Department of Education</b> Assistive Technology Resources  Minnesota Assistive Technology Manual	<a href="http://education.state.mn.us/MDE/Learning_Support/Special_Education/Evaluation_Program_Planning_Supports/Assistive_Technology/AT_Resources/index.html">http://education.state.mn.us/MDE/Learning_Support/Special_Education/Evaluation_Program_Planning_Supports/Assistive_Technology/AT_Resources/index.html</a> <a href="http://education.state.mn.us/mdeprod/idcplg?IdcService=GET_FILE&amp;dDocName=001089&amp;RevisionSelectionMethod=latestReleased&amp;Rendition=primary">http://education.state.mn.us/mdeprod/idcplg?IdcService=GET_FILE&amp;dDocName=001089&amp;RevisionSelectionMethod=latestReleased&amp;Rendition=primary</a>
<b>Oregon Technology Access Program</b> AT Model Operating Guidelines	<a href="http://www.otap-oregon.org/Pages/Default.aspx">www.otap-oregon.org/Pages/Default.aspx</a> <a href="http://www.otap-oregon.org/Documents/AT%20Model%20Operating%20Guidelines.pdf">www.otap-oregon.org/Documents/AT%20Model%20Operating%20Guidelines.pdf</a>
<b>Special Education Technology British Columbia (SET-BC)</b>	<a href="http://setbc.org/">http://setbc.org/</a>
<b>Temple University College of Education</b> Institute on Disabilities Pennsylvania's Initiative on Assistive Technology (PIAT)	<a href="http://disabilities.temple.edu/programs/assistive/piat/#a">http://disabilities.temple.edu/programs/assistive/piat/#a</a>
<b>Texas Assistive Technology Network (TATN)</b>	<a href="http://www.texasat.net/default.aspx?name=homepage">www.texasat.net/default.aspx?name=homepage</a>
<b>Wisconsin Assistive Technology Initiative (WATI)</b>	<a href="http://www.wati.org/">www.wati.org/</a>

## How One College Approaches Requirements

As an example, the Simmons College approach involves the demonstration of a combination of competency-based strategies for documentation of knowledge and skills. One method involves case studies. For example, a case study focused on the determination of different instructional strategies might investigate how to manipulate, collect, and create digital content. It would consider how learners process information as well as how learners stay motivated and involved. It would consider cognitive learning theories that support the use of accessible multimedia in the classroom. The goal would be to tailor activities to different learning styles and learning abilities. This understanding of how individuals learn leads to the creation of an accessible multimedia-based curriculum that keeps the learner at the center of the activity. Specialists would be asked to explain how existing research aligns with the activity they design and how the activity supports learning goals.

Another method involves active blended learning activities. Specialists research and summarize one special education assistive technology legal case. Online discussions incorporate laws that protect both professionals and students. Specialists take on the role of advocates, and use a participation rubric as they actively discuss the law with peers online.

Other methods include a variety of guided assessment experiences. The significant emphasis is on matching student or user need to the features available in the solutions being considered.

articles in this collection serve in varying roles on school teams. They have in common advanced assistive and instructional technology competencies. They understand that integrating technology has morphed from a separate specialty or expert model toward being a co-teacher who offers tools and refined strategies that facilitate implementation procedures.

The authors in this collection do much more than plug in the computer and select software or recommend adaptive access devices. They offer 21<sup>st</sup> century instructional resources and curriculum adaptation strategies that can be used to create 21<sup>st</sup> century learning environments.

They understand how technology integration adds value and can bring a strong infrastructure to today's classrooms. Their focus is not an expert model, but rather they assume more of a Universal Design perspective. Embedding tools and strategies leads to expanded teacher capacity and offers scaffolds to support a real-world range of learning challenges.

It is interesting to observe how the roles of each of the authors are inter-related. Sometimes the person on the team with the assistive technology expertise is the teacher. Sometimes this person is called an inclusion specialist. Sometimes this person is called the assistive technology and/

or instructional technology specialist. Some authors began in one professional role, such as educator or occupational therapist, but changed roles because they focused on mastering technology integration in their graduate studies. Each of the authors guides effective curriculum design by integrating tools and techniques that facilitate learning for all students. Each of the authors demonstrates how assistive technology and instructional technology can be seamlessly embedded and integrated effectively in inclusive classrooms with diverse learners.

Following is a brief preview of each author, along with a look at the particular competencies they demonstrate in their articles.

### **Teacher as Technology Integration Advisor**

Patricia Weismer is a special education teacher in an inclusive primary classroom. She collaborates actively with a speech/language pathologist and an occupational therapist to create accessible learning environments for students with a significant range of learning challenges. Their physical and language challenges demand technology intervention in order to participate fully.

Her article, entitled "Making Literacy Meaningful for Everyone in Inclusive Elementary Classrooms," is filled with models, tools, suggestions,



and strategies that can engage every learner in a meaningful literacy curriculum. She brings her extensive assistive technology expertise into the classroom, employing competencies that result in a multisensory and accessible literacy curriculum. She views literacy as not just learning to read and write, but also as writing and reading to learn in the content areas. Examples of curriculum development and technology-based competencies that she draws upon to accomplish this include:

- Identify reading and writing needs that must be addressed for successful learning.
- Employ a variety of reading and writing strategies for addressing learning objectives.
- Identify obstacles to academic achievement and implement appropriate strategies and tools that promote success.
- Learn how to utilize the Student/Environment(s)/Tasks/Tools (SETT) Framework and other strategies to systematically and effectively gather information to design an AT intervention plan.<sup>1</sup>
- Match developmental needs of learners with features available in software and/or adaptive access devices.
- Understand how to integrate and support a full continuum of low- to high-tech adaptive devices.
- Learn how to design and fabricate a low-tech assistive technology solution for a student with intensive special needs.
- Learn basic principles of designing an effective custom intervention.

- Demonstrate knowledge of the physical, cognitive, sensory, pragmatic, environmental and other factors to be considered when assessing a person's needs for Augmentative and Alternative Communication (AAC) systems and other assistive technologies.
- Demonstrate an understanding of the decisions involved in selecting vocabulary and the various ways to organize/present vocabulary.
- Develop a cache of online resources (both free and fee for service).
- Understand where to find digital content on the Internet.
- Convey knowledge of and enthusiasm for their academic discipline to students and professional peers.
- Master the art of creating a truly accessible classroom environment for learners with significant challenges.

## ***Inclusion Liaison as Technology Integration Advisor***

Gina Stefanini is an inclusion teacher who supports classroom teams in an elementary school. Her role requires a thorough understanding of the curriculum goals for the classrooms she supports as well as the challenges that various learners experience within these classrooms. She and the teams on which she serves understand that in order to provide meaningful learning experiences for their learners, they must find ways to make learning visible in multiple formats.

She weaves her considerable assistive technology and instructional technology skills throughout two articles. Her article entitled, "Documenting to Support Literacy Progress: Video Recordings That Make Learning Visible," describes her approach. She and her team incorporate the use of multimedia tools such as digital cameras to capture authentic images. They also incorporate audio and video recording equipment to provide ways to enrich, monitor, and document student progress. Students are engaged within their literacy curriculum in dynamic and meaningful ways well beyond traditional methods because of the tools they incorporate. Multimedia tools are viewed as opening doors for understanding and deeper meaning across the curriculum.

Ms. Stefanini's second article entitled, "Friendship Investigation Teams: Social Skills Training Teams That Make Learning Visible," addresses a growing curriculum focus for 21<sup>st</sup> century classrooms—social skills development. She advocates ways to incorporate multimedia tools so that students can practice and understand social skills and develop problem-solving strategies in ways otherwise not possible without the technology. The examples she provides illustrate the importance of flexible tool integration that results in meaningful and personalized curriculum skills practice. To her, seeing a video model makes learning social skills come

alive. The examples of curriculum development and technology-based competencies that she draws upon to accomplish these inspiring interventions include:

- Understand essential questions and their role in Understanding by Design.<sup>2</sup>
- Understand the application of Universal Design for Learning (UDL) principles to physical layout, software, hardware, and peripherals and the rationale for their use.<sup>3</sup>
- Produce documents for students that incorporate the standardized assessment guidelines for accommodations for special needs.
- Gain basic technical understanding and understand the differentiation potential of project-based learning integrating multimedia tools.
- Learn creative ways to construct simple and relatively inexpensive low-tech assistive technology devices.
- Learn the range of low-tech to high-tech strategies and tools to support learners with visual, hearing, or other sensory challenges.
- Learn about the complexity of handwriting and/or written communication and student expression and strategies to remove barriers.
- Demonstrate knowledge of alternative methods of communication, the skills needed for successful use of these methods, and the strengths and limitations of each.
- Uses project-based learning strategies to plan and execute lessons.
- Understand cooperative learning strategies and how they can be applied in an inclusive classroom.

- Understand how to design rubrics to assess student understanding.
- Understand Universal Design for Learning concepts (origins, examples, applications) and the implications for teaching and learning strategies.

## ***The Assistive Technology Specialist as Technology Integration Advisor***

Karen Janowski is an assistive technology specialist supporting inclusive classrooms throughout a large district by collaborating with school-based teams that also include inclusion specialists with technology integration expertise. She is responsible for coordinating services as well as specific assistive technology evaluation and unique student-specific recommendations. Her enthusiasm for proactively incorporating a range of readily available tools that are paired with implementation strategies goes a long way toward empowering inclusion teams prior to making the decision for full evaluation.

Her article entitled, “Technology and Web 2.0 Strategies for Executive Functioning,” discusses incorporating tools and strategies in support of learners who experience organizational and planning challenges. These students are often quite capable of performing required academic tasks, but require significant external supports and varying strategies in order to achieve to their full potential. Rather than working under an expert model,

the author describes these tools and strategies providing rich examples of ideas that teachers can employ. With her support and professional development efforts, classroom inclusion teams can readily implement these ideas. She believes that teachers need tool belts of technologies and strategies that allow them to create options for success. Examples of curriculum development and technology-based competencies that she draws upon to encourage these exciting interventions include:

- Understand highlights of the Individuals with Disabilities Education Improvement Act (IDEA 1997 and subsequent reauthorizations) as they relate to assistive technology and Universal Design for Learning.
- Gain basic understanding of the assistive technology field, laws, strategies, and potential applications.
- Understand principals of Universal Design for Learning, differentiated instruction, and accessible instructional materials.
- Demonstrate knowledge of individuals’ legal rights, of the laws that spell out these rights, and of funding options around assistive technology.
- Work to promote achievement by all students without exception.
- Convey knowledge of and enthusiasm for his or her academic discipline to students and professional peers.
- Maintain interest in current research or developments in the academic discipline and exercise judgment in accepting findings as



valid for application in classroom practice.

- Understand how to evaluate specific curriculum barriers based on an analysis of struggling students and make appropriate recommendations, including implementation strategies.
- Knowledge of available tools and experience on how to install, read documentation, explore, review, and present tools to others.
- Collect Internet resources in support of teaching learners with significant learning challenges.
- Develop a cache of online resources (both free and fee for service).
- Understand where to find digital content on the Internet.
- Make recommendations for a range of software genres.
- Understand the basics of how webinars are conducted.

## Professional Preparation and Development Across Various Roles

Regardless of how a professional might approach developing strong assistive technology and instructional technology knowledge and skills, it is essential that someone on a school-based team develop this expertise in a comprehensive manner. It takes highly skilled professionals to design cost- and time-efficient interventions.

Professionals charged with designing day-to-day implementation of assistive technology and instructional

technology should be prepared with a comprehensive range of tools and strategies. The more comprehensive the toolkit, the more options for making a perfect fit with the needs of learners. The more strategies mastered by the technology integration professional, the more likely it is that curriculum design will be successful. [See the list of recommended competencies for these individuals that is provided in the Appendix, “Comprehensive Categories and Skills: Competencies Recommended in Assistive Technology and Instructional Technology.”]

Educators and therapists charged with the mission of implementing technology integration plans deserve robust on-site support and professional development opportunities. These can be provided in a number of ways. First, and probably most time and cost efficient, the person on the team with the most comprehensive skills can provide peer enrichment workshops. While it is not likely that mastery across technologies will result, better understanding of how to use recommended tools is important for classroom success. Another resource could be webinars, or online learning opportunities, provided by publishers of technology tools. There also are agencies that have a mission to help communities understand implementation strategies. Further, other schools have developed and shared or posted online professional development modules that can be

replicated locally. [See the list of recommended resources for universities, professional organizations, and public school organizations, that offer these resources and programs in the textbox, “Resources.”]

## In Conclusion

Through the evolving role of the assistive technology/instructional technology specialist, classroom teams can discover models that are already successful in real school settings. The purpose of this collection of articles is to illustrate the value of assistive technology and instructional technology integration for curriculum access in 21<sup>st</sup> century inclusive classrooms. These classroom stories incorporate a combination of professional competency-based strategies, knowledge, and skills that lead to seamless technology integration. For example, an intervention focused on the determination of differentiation instructional strategies might investigate how to manipulate, collect, and create digital content. The articles illustrate that technology integration plans consider how learners process information as well as how learners stay motivated and involved. Cognitive learning theories that support the use of accessible multimedia in the classroom are considered. The goal is to tailor activities to different learning styles and learning abilities. Understanding how individuals learn will open the door to creating an accessible multimedia-based

curriculum that keeps the learner at the center of the activity.

Although not the primary intent of these articles, it is valuable for school administrators to understand that it is critically important for assistive technology and instructional technology specialists to be prepared professionally and possess the competencies necessary to ensure school team success and to further the integrity of the field. The classroom examples in this collection illustrate how professionals who offer these competencies on school-based teams can facilitate these types of successful classroom interactions. Whether competencies are measured by a written examination or demonstrated, and whether certifications are awarded by an overseeing professional organization or an institution of higher education, school administrators can learn from these examples and ensure that someone on the school team possesses a full range of skills within

this professional expertise. Although local district administrators cannot rely on a standardized credentialing procedure, our hope is that all states eventually will identify their own set of criteria for defining the knowledge and skill set required for practicing assistive technology specialists. In this way we can work toward an agreed upon set of competencies for professional practice.

Whether considering the needs of one learner, or a classroom of heterogeneous learning needs, or planning for an entire organization, it is important to keep people first, then integrate the tools that will facilitate reaching goals. The articles in this collection describe typical learning challenges from the teaching perspective, then embed tools and strategies seamlessly. I hope these examples give both educators and decision makers rich ideas for taking their own next steps.

## ENDNOTES

<sup>1</sup> For more information on the SETT Framework, see *Using the SETT Framework to Level the Learning Field for Students with Disabilities* (Revised 2005) by Joy Smiley Zabala, available at [www.joyzabala.com](http://www.joyzabala.com)

<sup>2</sup> Understanding by Design, developed by Grant Wiggins and Jay McTighe for ASCD, is a philosophy for improving classroom practice. Teachers serve in central roles as designers of student learning by making learning goals explicit, designing appropriate multisensory assessments, and creating engaging learning activities.

<sup>3</sup> According to the Center for Applied Technology (CAST), Universal Design for Learning is an inclusive educational philosophy that is based on the concept of creating flexible learning environments that are proactively planned to accommodate learning differences. Curriculum development plans design for: multiple means of representation—provide many ways for students to understand information and content; multiple means of expression—provide many ways for students to demonstrate what they know; and multiple means of engagement—provide many ways for students to experience content and skills practice by incorporating motivation into topics and themes.

## Appendix

# Comprehensive Categories and Skills: Competencies Recommended in Assistive Technology and Instructional Technology

*Note:* The following competencies—knowledge and skills—for an assistive technology and instructional technology specialist were developed by the author in collaboration with colleagues at Simmons College. The team based the competencies on clinical practice experience. In addition, the team based the competencies on an interpretation and synthesis of established competencies in the field. For example, the team consulted the competencies found in the Council for Exceptional Children’s document, “Knowledge and Skills: Special Education Technology Specialists.” They also considered the competencies suggested by the National Association of State Directors of Special Education (NASDSE) and Quality Indicators in Assistive Technology (QIAT).

## Guiding Principles and Legal Considerations

- Understand highlights of IDEA 1997 and subsequent reauthorizations as they relate to assistive technology and Universal Design.
- Demonstrate an understanding of the American Speech and Hearing Association’s (ASHA) Position Statement related to AAC.
- Describe legal terms/definitions related to assistive technology.
- Gain basic understanding of the assistive technology field, laws, strategies, and potential applications.
- Understand principals of Universal Design for Learning, differentiated instruction, and accessible instructional materials guidelines.
- Demonstrate knowledge of individuals’ legal rights, of the laws that spell out these rights, and of funding options around assistive technology.
- Promote achievement by all students without exception

## Administration and Assessment Skills

- Use the SETT Framework and other strategies to systematically and effectively gather information to design an assistive technology intervention plan.
- Match developmental needs of learners with features available in software and/or adaptive access devices.
- Understand how software designed for accessibility can be used to support the diversity of student needs.
- Identify the components of an assistive technology assessment for students with high-incidence disabilities.
- Understand how to integrate and support low- to high-tech supports.
- Understand the importance of seating and positioning for optimal access.
- Learn assessment tools to determine technology access options for students with severe physical disabilities.
- Learn methods and strategies for developing mastery of single and multiple switch use.
- Learn how to design and fabricate a low-tech assistive technology solution for a student with intensive special needs.

## Appendix (continued)

### **Administration and Assessment Skills (continued)**

- Learn basic principles of designing an effective custom intervention.
- Identify appropriate team members and their respective roles in selecting assistive technologies.
- Demonstrate knowledge of the physical, cognitive, sensory, pragmatic, environmental, and other factors to be considered when assessing a student's needs for AAC systems and other assistive technologies.
- Demonstrate an understanding of the decisions involved in selecting vocabulary and the various ways to organize and present vocabulary.
- Learn how to assess when to use direct selection access versus scanning or an alternate access device.
- Design and implement a portfolio assessment environment and align procedures with required alternate assessment protocols.
- Understand how to evaluate specific curriculum barriers based on an analysis of struggling students and make appropriate recommendations, including implementation strategies.

### **Guidance, Professional Development, and Advisory Skills**

- Convey knowledge of and enthusiasm for his or her academic discipline to students and professional peers.
- Maintain interest in current research or developments in the academic discipline and exercise judgment in accepting findings as valid for application in classroom practice.
- Demonstrate knowledge of available tools and experience on how to install, read document, explore, and review and present tools to others.
- Collect Internet resources in support of teaching learners with significant learning challenges.
- Develop a cache of online resources (both free and fee for service).
- Understand where to find digital content on the Internet.
- Make recommendations for a range of software genres.
- Understand the basics of how webinars are conducted.
- Conceptually identify applicable classroom/student uses for distance learning.
- Understand Universal Design for Learning concepts (origins, examples, applications) and implications for teaching and learning strategies.
- Understand how to design an environment that accommodates a range of abilities.
- Organize and deliver information about assistive technology in professional support of service delivery teams. Convey how to use these tools in the classroom through high-quality professional development.

## Appendix (continued)

### ***Achieving and Implementing Curriculum Integration***

- Identify reading and writing needs that must be addressed for successful learning.
- Employ a variety of reading and writing strategies for addressing learning objectives.
- Identify obstacles to academic achievement and implement appropriate strategies and tools that promote success.
- Learn keyboarding skills continuum (from grades K–12) and identify software and/or web-sites to teach and practice keyboarding.
- Understand and adhere to curriculum standards when selecting software and technology resources.
- Understand the differences and similarities of each type of educational software and applications.
- Become familiar with a wide range of fully accessible curriculum software.
- Understand the accessibility and functionality of social bookmarking.
- Use project-based learning strategies to plan and execute lessons.
- Understand cooperative learning strategies and how they can be applied in an inclusive classroom.
- Understand the importance of digital content in a universally designed classroom.
- Understand the potential ways to use text-to-speech in support of content delivery.
- Design rubrics to assess student understanding.
- Create an accessible classroom environment for learners with significant challenges.

### ***Fundamental Skills***

- Learn operating system controls in both Mac and Windows.
- Learn options for name, format, and file management.
- Identify free, online tools that support students with learning challenges.
- Use instructional and assistive technology appropriately.
- Gain basic technical understanding and understand the differentiation potential of project-based learning integrating multimedia tools.
- Learn creative ways to construct simple and relatively inexpensive low-tech assistive technology devices.
- Learn the range of low-tech to high-tech strategies and tools to support learners with visual, hearing, or other sensory challenges.
- Learn about the complexity of handwriting/ written communication and strategies to remove barriers.
- Demonstrate knowledge of the terminology associated with AAC.
- Demonstrate knowledge of alternative methods of communication, the skills needed for successful use of these methods, and the strengths and limitations of each method.
- Demonstrate knowledge of the various methods and positioning considerations for accessing computers and AAC systems.
- Demonstrate knowledge of the various symbol systems available and of the factors involved in determining the appropriate symbols to use with a given candidate.
- Demonstrate basic competency in the use of software for making communication boards.

## Appendix (continued)

### Fundamental Skills (continued)

- Demonstrate knowledge of the skills/competencies needed to use fixed and dynamic display systems, word-based systems, word and icon prediction software, and semantic compaction.
- Demonstrate knowledge of the factors that lead to successful implementation and use of AAC systems and of those factors that impede success.
- Demonstrate knowledge of assistive technologies available in the areas of AAC, environmental control, computer access, positioning and mobility, mounting systems, and/or switches.
- Demonstrate an understanding of the role of AAC in fostering emerging literacy.
- Learn the physical, cognitive, and emotional challenges experienced by students with severe disabilities.
- Learn environmental control options for students with severe disabilities.
- Learn how to use a variety of direct and scanning access tools and software to support the participation of students with severe disabilities in the classroom.
- Learn a variety of tools for computer access for students with severe disabilities.
- Learn resources for leisure and recreation for students with severe disabilities.
- Understand and apply basic programming concepts (e.g., organization, sequencing) and consider the classroom implementation possibilities and limitations.
- Identify applicable classroom/student uses for online subscription software.
- Use a scanner and other multimedia hardware tools.
- Use text-to-speech software.
- Focus on the classroom implementation possibilities and limitations of animation software and identify and begin to develop lessons using animations.
- Identify and use various aspects of using spreadsheets, including formulas, charts, formatting, etc.
- Identify and use various aspects of word processing.
- Produce documents for students that incorporate the standardized assessment guidelines for accommodations for special needs.
- Understand general principles of accessible websites.
- Understand essential questions and their role in Understanding by Design.
- Understand the application of Universal Design for Learning principles to physical layout, software, hardware, and peripherals deployed, along with the rationale for their use.

# CHAPTER 2

## Making Literacy Meaningful for Everyone in Inclusive Elementary Classrooms

**Patricia B. Weismer**

Special Educator, Wellesley Public Schools

Find out how technology can be used to create group literacy experiences, create individualized guided activities, and foster independent practice of skills.

Literacy is defined often as the ability to read and write. Many students with complex needs are unable to meet the goals of a traditional literacy curriculum. Without specialized support, they may not be able to access literacy instruction and materials. When thinking about literacy instruction, it is important to think about the reasons behind reading and writing. By thinking of literacy as a means to communicate information for a social purpose, we are able to think about ways to modify activities for students with different challenges (Miles, 2005).

Providing engaging literacy materials to these students can be challenging. Age appropriate materials are limited. Often, these students are left with age inappropriate, commercially available materials that were created for very young children—and even these are in short supply. This can lead teachers to provide their students with the same materials year after year.

As educators, our goal must be to make literacy interesting and appropriate for all students. We need to expand their access to appropriate materials and



to engage them with text and literature. One way that we can do this is to adapt available literacy materials and/or create our own and to make use of already existing resources. In doing this, we can create a literacy unit that contains a variety of activities, with different modes of engagement, while teaching a variety of skills to each student. Technology helps us put books into our students' hands. Our goal is to create a well-rounded literacy curriculum that includes opportunities for students to engage with peers, work on individualized skills, and benefit from independent practice.

There are several areas to explore:

- Creating group literacy experiences, including reading aloud to students.
- Creating individualized guided literacy activities that include appropriate small group or individual activities to meet individual reading goals.
- Fostering independent practice of all reading skills.

This chapter will explore how technology tools can enhance each of these areas. The tools that can create a motivating literacy experience may be low tech or high tech. Making a simple modification to a book—such as making the pages easier to turn—can give some students the opportunity to be independent. Other times, it may be necessary to explore higher tech options to help increase student independence and active engagement.

## Creating Group Literacy Experiences

One of the most important aspects in creating appropriate group reading experiences is ensuring that all students are able to engage with the text being presented. Within a general education elementary classroom, students often sit on the rug while a teacher reads a story to the class. Most of these students are able to listen to the teacher reading the story, and they are able to see the pictures in the picture book. There are various reasons that some students may have difficulties engaging during these times. A student may not be able to sustain attention to a book and/or to a reader who is not close to him or her. A student with visual or hearing impairments may have physical barriers to engaging with the lesson. Also, students with physical needs may be unable to see the materials presented because they are unable to position themselves appropriately.

It also is necessary to consider students' cognitive needs. Some students may need support in order to understand the content of the story. Students with cognitive challenges may need a way to communicate ideas during a lesson. It is important to provide students who are nonverbal or who may have challenges expressing ideas with a voice. At times, it may be necessary to provide students with smaller group opportunities in order

to maximize their attention and active engagement.

Many modifications serve to enhance the literacy experience for all students. The most important consideration for a reading lesson is to ensure that all students have appropriate access to the text. There are several ways that this can be accomplished by using a variety of methods at different times. It also may help to provide a preview of some vocabulary or elements in the story. Here are some ideas to provide access to the text:

- **Provide an extra copy of the book.** This accommodation provides a student close-up access to the content of the lesson. If it is appropriate, a peer in the class also can look at the book and provide the student with support for turning the pages. If needed, a teaching assistant or another adult can help manage the extra copy of the book.
- **Project the book onto a screen.** Many classrooms are equipped with a document camera such as an Elmo ([www.elmoussa.com](http://www.elmoussa.com)). Using this to project a book onto a large screen enhances the reading experience for the whole class and may eliminate the need for extra copies. This works best for students who are better at sustaining attention to a large-group lesson but who may have difficulty seeing the book.
- **Create an outline with picture cues.** Sometimes it may not be possible to make the book more accessible. In this case, it may be appropriate to create a picture outline of the story. This can give

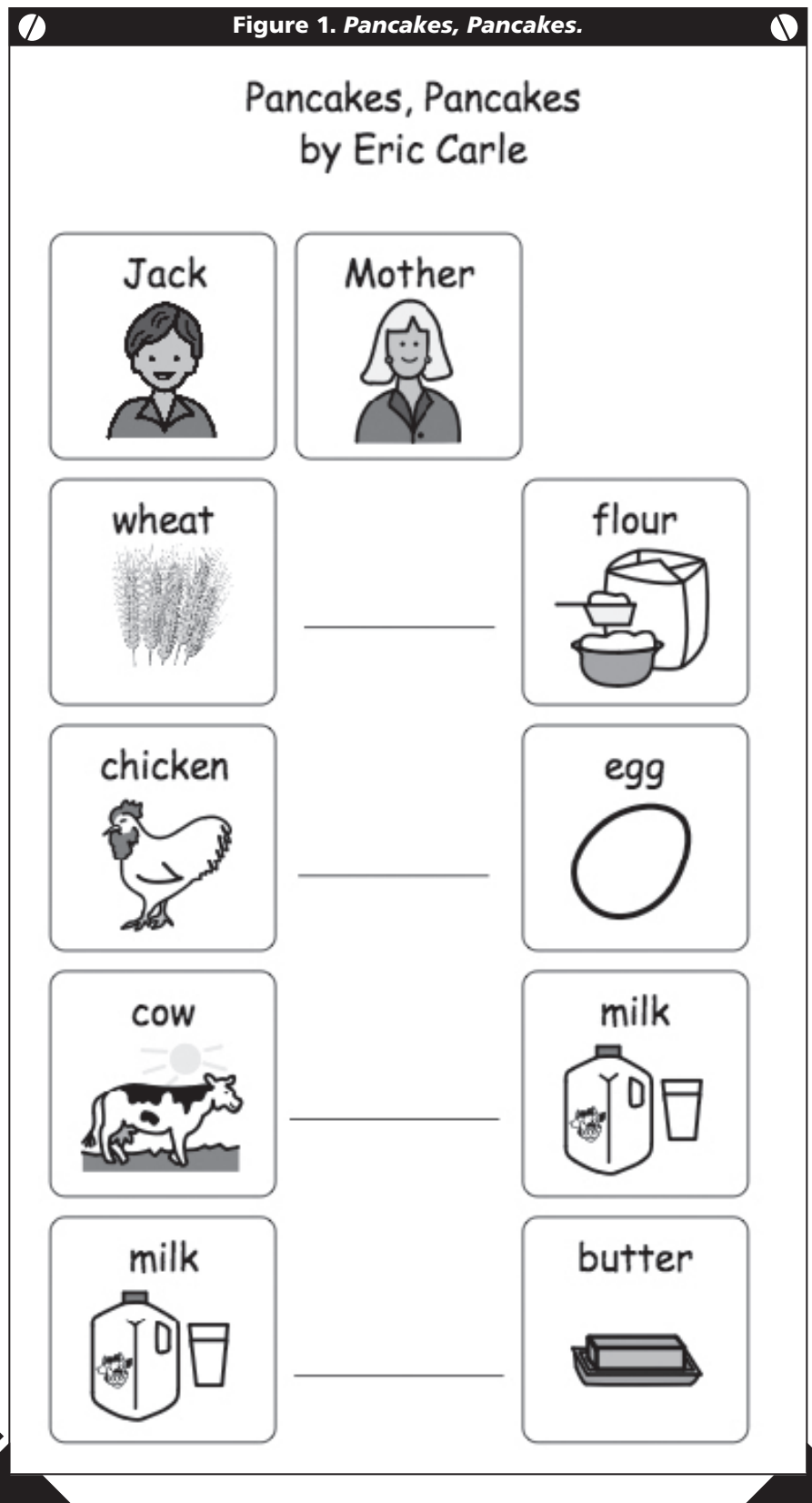
students a visual cue while listening to the story, and therefore help them maintain attention to the content presented rather than looking around at the environment. Figure 1 shows a picture outline for the book *Pancakes, Pancakes* that was part of a lesson (for a description of the lesson, see Appendix 1, “A Literacy Unit: *Pancakes, Pancakes* by Eric Carle”).

## Creating Individualized Guided Literacy Activities

Using a motivating text as a basis for literacy activities can help enhance student engagement and motivation. Deciding what to teach should be based on the individual literacy goals for each student and can incorporate comprehension and vocabulary lessons, phonics lessons, reading, or even writing lessons.

When planning more individualized activities, consider students’ cognitive needs and ensure that all materials are physically accessible. It also may be necessary to find additional texts on related topics or create a simple and accessible text to enhance the lesson. It may be appropriate to provide a modified text or book that students can use later for independent practice.

It may be necessary to read the same text or do the same activity many times in order to keep some students engaged with the content. Individual literacy activities should be presented in a variety of access modes so that



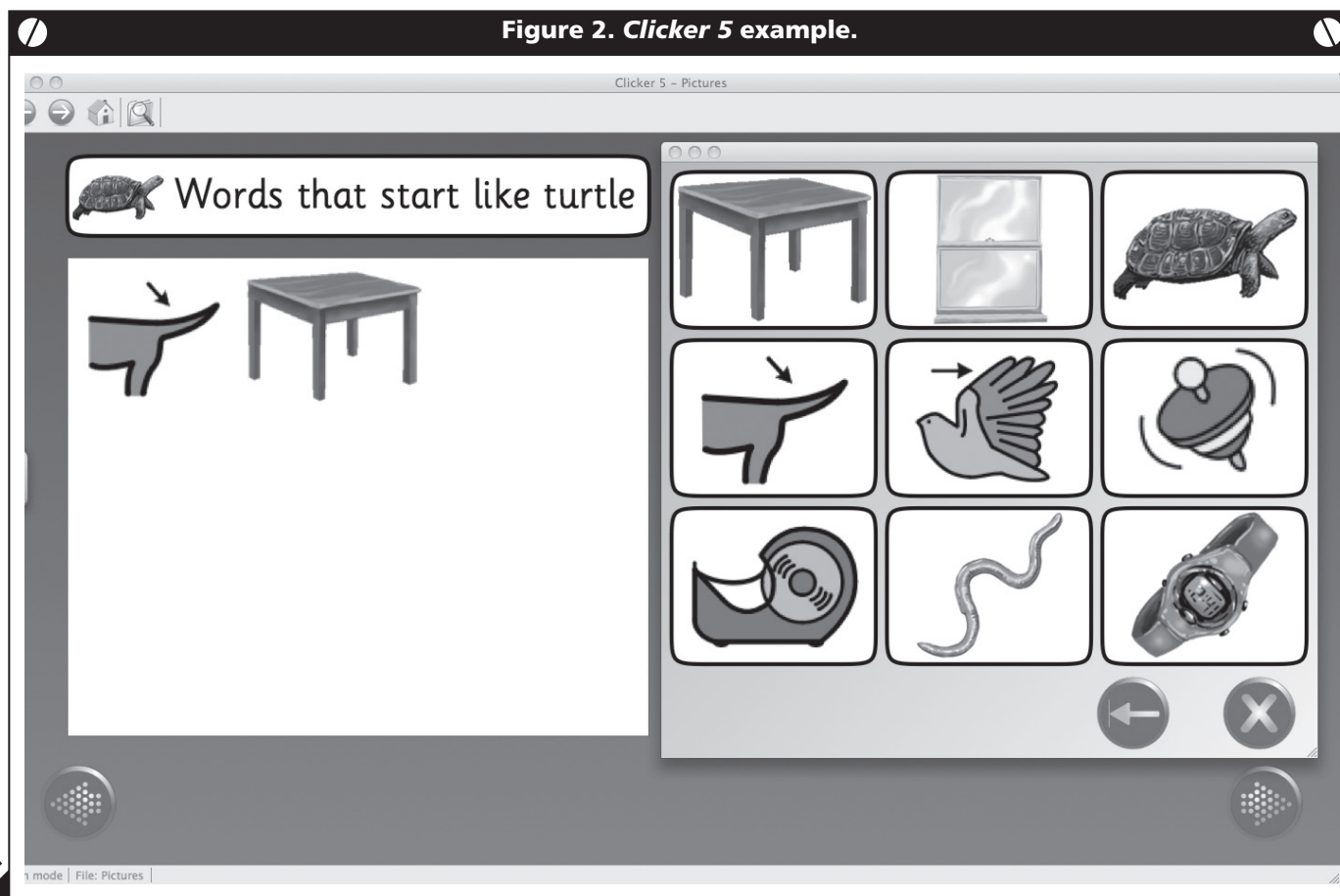
students are motivated to remain engaged with the content. Students might listen to the text read by a teacher or a peer, and then access the same text in an electronic format on the computer (see the textbox, “Technology Resources,” for examples of tools that can help with this). Electronic text might be enhanced with such supports as additional pictures or symbols to support comprehension or a glossary option for challenging words. Animations may be added to electronic text to engage students and enhance comprehension. If available, students also may

be provided the opportunity to listen to the audio book version. By providing students with a variety of ways to engage with the same material, they will continue to be motivated.

Creating motivating and accessible phonics and spelling activities can be challenging. Again, it may be necessary to provide students with various ways to engage with appropriate content. One method commonly used to teach a lesson on initial sounds is matching pictures to words that all start with a different consonant sound. Rather than create an activity

with random vocabulary, teachers can pull vocabulary from a familiar text to make the activity more exciting and increase student attention. Phonics lessons should be individualized to target the specific skills students are working on. It also is beneficial to create additional activities with different modes of engagement to provide independent practice when possible. For example, after completing a picture to word matching activity within a group on a slant board, students may have the opportunity to try a similar activity on an interactive white board. A similar activity also can be

**Figure 2. Clicker 5 example.**



created using specialized software such as Clicker 5 or Boardmaker Plus! (see Figure 2) where the student can type or match the initial letter to a picture). Students who need multiple

repetitions to practice and master a skill will benefit from demonstrating skills in different ways. This also can be used to assess students' independent skills and mastery of a concept.

A variety of ways to enhance lessons with technology tools follows.

## Technology Resources

### Get Help! Don't reinvent the wheel

These are just a few of the resources available. It may be best to pick just a few tools at first. Becoming more familiar with them will make implementing lessons easier.

Always get help where you can. Creating all of your own activities can be very time consuming. Listed below are some helpful software applications and great places to get additional resources.

#### BOARDMAKER PLUS! v6

([www.mayer-johnson.com](http://www.mayer-johnson.com)). Use Boardmaker to create printable communication boards. Create interactive computer-based activities including worksheets, books, writing activities, and games. These are great to project on an interactive board. Many activities are available to download at [www.boardmakershare.com](http://www.boardmakershare.com).

#### CLICKER 5 AND CLICKER PAINT

([www.cricksoft.com](http://www.cricksoft.com)). These are great when used together. Use Clicker 5 to create books, writing activities, interactive worksheets, and vocabulary activities. Students can demonstrate comprehension by creating illustrations using Clicker Paint. There are many activities available to download at [www.learninggrids.com/us](http://www.learninggrids.com/us).

#### INTELLITOOLS CLASSROOM SUITE 4

([www.intellitools.com](http://www.intellitools.com)). Use Classroom Suite 4 to create books, writing activities, interactive worksheets, math activities, and vocabulary activities. Activity templates within the software are designed to make creating individualized activities simple. There are many activities available to download at the Classroom Suite Activity Exchange at <http://aex.intellitools.com>.

#### READINGA-Z.COM AND RAZ-KIDS.COM

([www.readinga-z.com](http://www.readinga-z.com)). Readinga-z.com and Raz-Kids.com are subscription-based websites. Readinga-z.com provides books, worksheets, and lesson plans for leveled reading. Books on various fiction and nonfiction topics can be downloaded. On Raz-Kids.com students can engage with online books. Students can listen to the books, read the books, and answer comprehension questions. This is a great place to get additional books for a literacy unit.

#### TAR HEEL READER

(<http://tarheelreader.org>). Tar Heel Reader provides a collection of free, easy-to-read, and accessible books. It is a good place to get books that students can read individually. It also is a forum where you can publish books that you have written with your students.

#### ACCESSIBLE BOOK COLLECTION

(<http://accessiblebookcollection.org>). The Accessible Book Collection is a subscription-based resource where trade books can be downloaded. Students must qualify in order to join. They must have a vision impairment or another disability. Most books are available in HTML format. There are some books available in various formats including Boardmaker Plus!, Clicker 5, and Intellitools Classroom Suite. This is a nice way to make books available for independent reading times.

## Use Communication Boards

Communication boards are much more than tools for expressive communication. Communication boards can be valuable tools even for students who have acquired a high level of verbal language. They can serve as receptive tools to aid students with vocabulary and comprehension. A teaching assistant or a peer can help by pointing to main ideas while the teacher is reading a story.

In addition, students also can use the boards as tools to help with word retrieval. The picture supports can help students learn less familiar vocabulary by labeling a specific word that may not be clearly defined within the text. For example, some books may present unfamiliar animals or objects in the text, and the text pictures may be too busy and/or too complicated for students to find the target vocabulary. The communication boards can label the pictures in a simple format. It also may be beneficial to put pictures directly from the text paired with real photos to help enhance vocabulary learning.

Communication boards can be used to help students begin exploring more abstract concepts in a book. These boards may include vocabulary related to other concepts in the books and they can be created to target a specific topic such as character feelings, theme of a story, or personal connections. A board related to character feelings can provide students

with vocabulary choices for a variety of appropriate and inappropriate character emotions. Using the text, students can explore and discuss how different characters are feeling in relation to different events in the book. Vocabulary lists may encourage students to think about less familiar emotions. This is particularly successful for students who always jump to the same conclusion such as “happy” or “sad.”

As students explore different concepts about a text, they may have several different boards that are connected to the same book. They may have a simple board that enhances comprehension and a different board later on when they are exploring more complex ideas. Think of these boards as both expressive tools and receptive tools that are helping to guide student thinking. See Figure 3 for an example of an activity from a lesson based on the book, *Worm Builds*. [See Appendix 2, “A Literacy Unit: *Worm Builds* by Kathy Caple,” for an example of the lesson.]

## Use Picture Cards from the Book

Another accommodation for comprehension lessons is to take several photos of the book. Students can organize these pictures in the correct order to demonstrate understanding of beginning, middle, and end. They also can use them as a tool to answer questions about the story.

## Use Book Vocabulary for Phonics and Handwriting

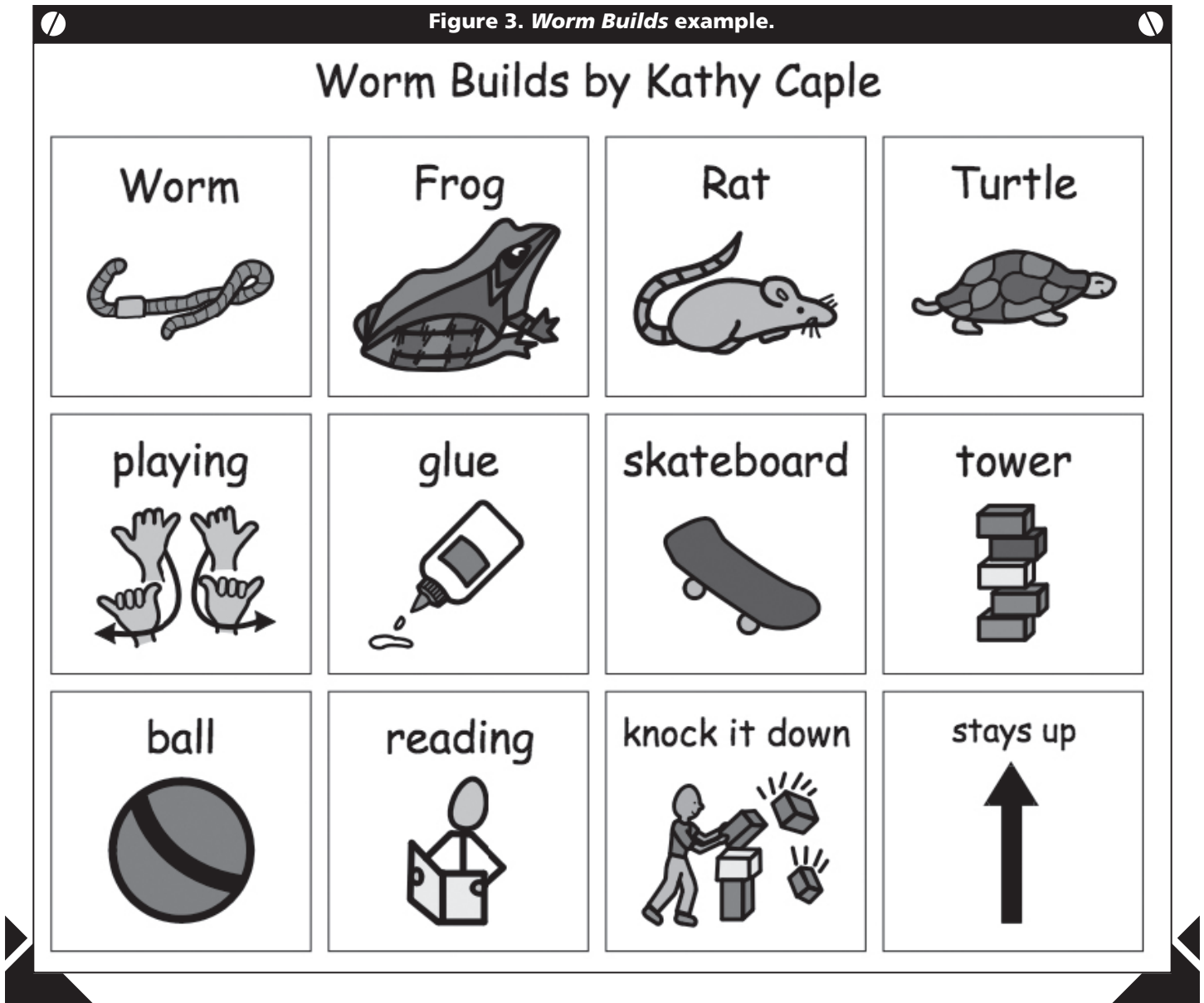
Using a few familiar words from the book as the basis for a phonics activity can motivate students. Vocabulary cards can be created from photos, line drawings (using software such as Boardmaker), or even the props used when reading the book. A picture sort or a picture-word match activity can be created using authoring software such as Clicker5 using the pictures from the book, photos, or line drawings that are used when reading the text. Practicing writing initial letters or words of a familiar character or object from the story can enhance vocabulary development while also working on mechanical handwriting skills. Handwriting also can be practiced using an electronic white board with photos and pictures from the text to enhance engagement. See Figure 4 for an example.

## Create Books Together

Working together to create a book can provide a valuable reading and writing lesson. Taking pictures when acting out a text or doing an extension activity can provide the basis for a self-created book. The pictures also can be printed and the book can be created as a table activity. The pictures also can be imported into presentation software or educational software to create an electronic book.

Using software can provide students with the opportunity to practice



Figure 3. *Worm Builds* example.


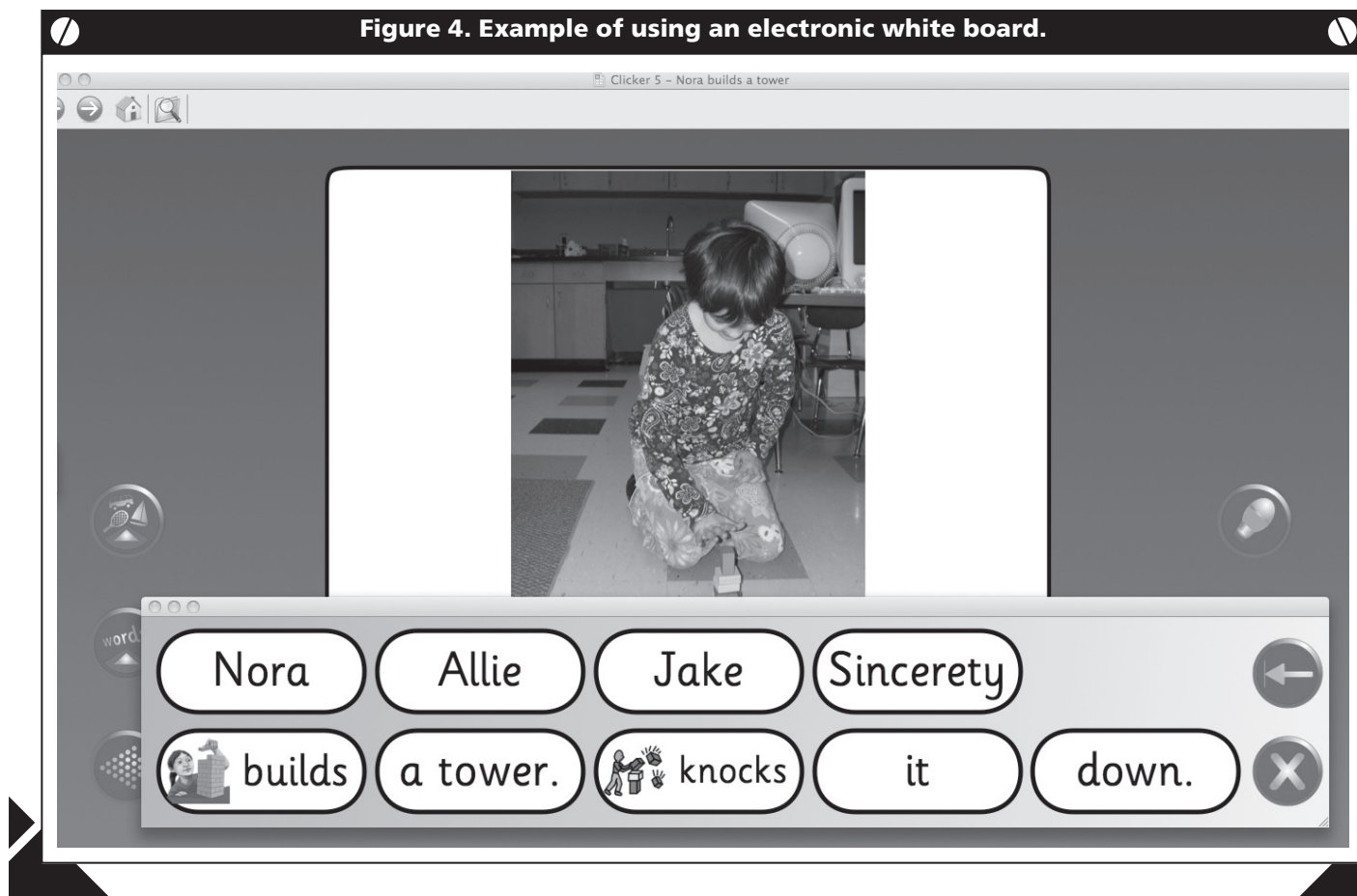
writing and/or reading text and even recording their own voices into the computer. They can listen to themselves reading and practice increasing their reading fluency. During this process teachers can address various literacy skills such as identifying vocabulary, putting words in the correct order, or writing high frequency words. Students can create books

at their independent reading levels. Depending on students' abilities, it may be appropriate to create books with only one word on each page, using simple pictures or symbols. It also may be helpful to pair the pictures with small objects. These books can then be used for independent practice activities.

### Use Props

Props can be a fun way for students to express story comprehension. Students can use the props to retell the story or answer various comprehension questions. Props can be used by students to explore more abstract concepts in a book such as understanding character feelings, exploring

Figure 4. Example of using an electronic white board.



the problem posed in the story, or predicting events in the story. For young children, keep the props available during free times so that they can use them for pretend play activities. Students naturally retell stories that are familiar.

### **Provide Other Texts on Similar Topics**

It may be beneficial to provide students access to additional texts on related topics. These texts could be more appropriate to their cognitive levels. For example, creating a

vocabulary book with target words may be helpful. For some students, a book with only one word in large print on each page may be necessary.

## **Fostering Independent Reading**

An important goal of literacy instruction is fostering a love of independent reading. Students who have been taught to enjoy books typically enjoy reading them repeatedly.

For many students with disabilities, the goal of independence is often an

afterthought. Literacy experiences are often initiated and guided by an adult. Providing students with rich literacy experiences can motivate them to practice the skills on their own without adult support.

A major challenge when working with students with disabilities involves finding accessible books. It may be necessary to expand the idea of independent reading to a variety of literacy activities. The challenge is to provide as many opportunities as possible and access to as much repetition as possible. It is important to



## Making Accommodations and Modifications to Books

### Physical Needs

- Page fluffers (use a paper clip to affix a small piece of foam to make pages easier to turn).
- Laminate the pages.
- Put the pages into page protectors.
- Use a stand to hold the book.
- Create an electronic book.

### Visual Needs

- Enlarge the text.
- Simplify the pictures (e.g., remove backgrounds and extraneous items, etc.).
- Add tactual items.

### Cognitive Needs

- Simplify the text.
- Add picture symbols.
- Add photos.

maintain a library of familiar books. Keep books nearby, even after the formal teaching of the text has been completed. Rereading familiar stories can provide practice.

Providing independent access to text can be challenging when students are unable to access traditional books at an age-appropriate level. It may be necessary to modify books to make them accessible. When modifying books, the ultimate goal should be for students to engage with them independently. It is necessary to consider physical access to the book, visual needs (both vision and attention related), and students' cognitive

needs (see the textbox, "Making Accommodations and Modifications to Books," for examples).

The Center for Literacy and Disability Studies ([www.med.unc.edu/ahs/clds/resources](http://www.med.unc.edu/ahs/clds/resources)) provides ideas for creating tactual books. While these books are primarily designed for students with vision impairments, many of the ideas also are beneficial for other students. Adding some tactual elements to a book can help provide a cue for students who are struggling with vocabulary or word retrieval. For example, a cap to a milk container can be placed onto a picture of milk. The same milk cap can be used during

a cooking activity so that students become familiar with the materials. It is beneficial if the tactual items placed into a book are similar to the props used during the read aloud so students are familiar with the materials.

Another way to make accommodations and/or modifications to materials is to create an electronic book. An electronic book can be created in specialized software or any presentation software that is readily available such as Microsoft PowerPoint. When creating an electronic book, consider the individual needs of each student and make the necessary changes to the pictures, text size, and content. Make sure students have independent control of the book. When possible, students should be able to turn the pages forward and backward so they can reread their favorite parts. If the book produces audible text-to-speech, students should be able to choose to have the spoken text on or off. Providing a bookshelf from which students can choose preferred books from an array of choices also is beneficial.

Creating lessons that encourage students to take an active and engaged role will help them develop a love of reading. Then, providing them with independent access will give them the ability to read and write for functional purposes and for pleasure.

## References

Miles, B. (2005). Literacy for persons who are Deaf-Blind. *National Consortium on Deaf-Blindness*. Retrieved from <http://nationaldb.org>

Pinell, G., & Fountas, I. (2002). *Phonics lessons: Letters, words, and how they work, Grade 1*. Portsmouth, NH: Heinemann.

### Appendix 1

#### A Literacy Unit: *Pancakes, Pancakes* by Eric Carle

##### Additional Texts

- *Pancakes for Breakfast*, by Tomi DePaola
- *Pancake Song*, by Christina Rossetti
- Any cookbook with photos of pancakes

##### 1. Preview and preteaching

- Cooking class! Make sure that everyone has first hand knowledge about pancakes and make them together. Use a picture recipe to make the pancakes. Take pictures of the process to make a class book. Have a class discussion about what you like on your pancakes.
- Poetry time! Read and act out the *Pancake Song*. This is a great time to practice some high frequency words!
  - ♦ Mix a pancake.
  - ♦ Stir a pancake.
  - ♦ Pop it in the pan.
  - ♦ Fry the pancake.
  - ♦ Toss the pancake.
  - ♦ Catch it if you can.

##### 2. Reading the book

- Have a communication board when reading the books.
- Project the book onto a screen to show the pictures.
- Use props when talking about the story. Most ingredients are readily available.

##### 3. Small-group activities

- Read the book using props. Act out the story.
- Use the props to retell the book and sequence the story. This is a great chance for students to act out the story on their own.
- Leave the props out and available with the book during free play times.
- Practice handwriting the letter P.
- Do a sound sort with /p/ (for pancake) and /j/ (for jam).

##### 4. Individual activities

- Make an electronic version of the book available. A Boardmaker Plus copy is available at [www.accessiblebookcollection.org](http://www.accessiblebookcollection.org)
- Sequence the steps for making pancakes using Clicker 5 or Boardmaker Plus.
- Make a vocabulary book about pancake ingredients.

**Appendix 2**  
**A Literacy Unit: *Worm Builds* by Kathy Caple**

**Additional Texts**

- *Worm Paints*, by Kathy Caple
- Poem about friendship

**1. Preview and preteaching**

- Vocabulary book. Make a book with photos of real worms, frogs, turtles, and rats. This is a great activity to do together and work on letter names/sounds, vocabulary, and print awareness skills.
- Poetry time! Read a poem about friendship. Great time to find high frequency words, talk about letter names/sounds, and print awareness skills.

**2. Reading the book**

- Have communication boards when reading the books. Depending on the lesson, you may want a different board.
- Project the book on a screen to show the pictures.

**3. Small-group activities**

- Give each student a copy of the book. Make books accessible by using page fluffers or by cutting up the book and laminating it for easy page turning.
- Use props when talking about the story. Make puppets using photos from the book or use stuffed animals.
- Leave the props out and available with the book during free play times.
- Reread the book several times. Teach different lessons:
  - ◆ Practice retelling the book. This is a good chance to act out the story.
  - ◆ Think about the story elements. What is the problem? How does it get fixed?
  - ◆ Think about social play skills. Talk about how the worm is feeling when his tower gets knocked down!
- Make your own book. Take pictures and make a version with the students as the main characters.

**4. Individual activities**

- Reread individual copies of the book.
- Make an electronic version of the book available. Use Clicker 5 and have students put the sentences in order.
- Make a vocabulary book with words from the book.



CHAPTER  
3

Find out how  
documentation  
practices  
enhanced with  
technology  
can support  
students'  
literacy  
progress.

# Documenting to Support Literacy Progress

## Video Recordings That Make Learning Visible

**Gina Stefanini**

Adjunct Professor, Wheelock College, and Educator, Brookline Public Schools

**D**ocumentation practices have made a significant difference in the work and progress of our students with literacy delays. Documentation is described as the practice of observing, recording, interpreting, and sharing the processes and products of learning through a variety of media in order to deepen and extend learning. [For more information, see the Making Learning Visible, Project Zero, Harvard University website at [www.pz.harvard.edu/mlv](http://www.pz.harvard.edu/mlv).]

Documentation practices typically require an adult facilitator, video and/or photographic equipment, students, and weekly recording/viewing sessions. Documentation goals include the following:

- Communicate and create a sharing learning environment for students, parents, and educators.
- Make individual learning available to the group and support collective knowledge building.
- Support student literacy progress.

There is much value in documentation. It helps teachers identify progress and denote the end product of student work. Documentation also can be used to support interpretation of student progress and planning for the next steps.

Moreover, when we include the other members of the learning community, especially students, then documentation practices can extend to the entire

learning group. Specifically, when we allow students to observe, record, and interpret, we allow them to deepen and extend their own learning. When we include a variety of media and student learning styles, we make the documentation for student observation and interpretation available.

Documentation of student reading over time serves multiple purposes. It can convey a variety of information and skills, from reading fluency techniques and decoding skills to strategic reading strategies and student reflection. This documentation makes learning visible so that students can reflect, share their new learning, learn from each other, and revisit their progress. Similar to the idea of a portfolio, it becomes a living document that is used as a tool for students to further their learning with and from each other.

The purpose of this chapter is to describe an approach for documenting literacy practices using technology tools.

## Documentation in Action

Video recordings that make learning visible focus on practical applications and student progress. This strategy allows easy access to specific literacy behaviors that can be applied to student reading. Students use this documentation to understand the learning process and its products

and to balance content learning with learning about learning. Consider the following examples.

### **Allan and Jim Learn How to Read**

Allan and Jim are new learners in the school. Learning how to read and participating in literacy activities are challenging. Frustration has created barriers to learning and left them with little to no entry points into their classroom. With the use of documentation, Allan and Jim were able to:

- See how they learn.
- Notice how they can participate with their classmates.
- Engage in a learning process that was not available to them previously.

Allan and Jim began this process with a digital camera and a mission to see what their classmates do during literacy time. As they documented and reviewed this new information, Allan began to notice specific behaviors of his classmates. They included always having a pencil, pointing to words, and smiling at the teacher. Allan wondered about these behaviors, and with guidance, he was provided with support to try out these behaviors and document his own work in literacy. Soon, both Jim and Allan noticed that their behaviors were matching those of their peers. These new discoveries led them to understand and apply the techniques of learning how to learn.

**Documentation provides educators and parents with a unique look into the process of learning—not just the end result.**

### **Chris, Tom, and Joe Expand Their Literacy Skills**

Chris, Tom, and Joe use documentation to better understand their own learning and progress. These students also share what they learn with peers and educators. These learning conversations are paramount to their progress.

Chris only had other nonreaders to learn from when he began to learn how to read. With documentation practices, Chris began to watch his peers read and reflect on their strategies. Chris began to film his own reading and, over time, he began to notice his progress and how he incorporated the strategies of his peers.

Tom also used documentation to share his work with a peer. He wanted to see how he used punctuation, and another classmate shared the same interest. Both reviewed videos of their reading and went back to the original text with new ideas about how to read with better intonation and fluency.

Joe wanted to document how he sustained his efforts to complete a project. He documented not only the final assignment, but also the process of learning. Reflection was about the process, not the product.

## Setting Up Documentation Stations in the Classroom

Setting up stations that allow students and teachers to document reading samples along with reflective commentary from students is an efficient way to implement the method. Inexpensive hardware—which may include donations from parents and used equipment—is available at the station, which allows for the flexible use throughout the school day. Student files also are organized at the station. This promotes student independence, which is paramount since students quickly become adept at documenting. Allowing students to access their documentation is akin to allowing them to view their art portfolio or social studies binder. Sharing between students and learning groups expands group knowledge and fosters a community that values their work and the ability to support their classmates. Setting up group norms provides the support students need to learn how to use and share digital media, an imperative learning experience for 21<sup>st</sup> century learners.

Following are procedural steps for documenting in the classroom:

1. Identify students and secure permission from administrators, parents, and the students themselves.
2. Obtain a digital camera with video capability. For example, check with your library, technology teacher, PTA, parents of the cohort, etc. Familiarize yourself with the basic features.
3. Find a quiet place to record. Face the student away from noise. A classroom corner with the recording device pointed toward a wall works well.
4. Start small and simple. First use photos and then move to very short (10-30 second) video clips.
5. Establish expected behaviors. Provide frequent modeling for both video recording and reflection. Allow for fun and experimentation.
6. Devise a list of prompts to help students participate in video reflection:
  - ◆ What did you look at when you read? What words were easy to read?
  - ◆ What do you think will happen if you read it again?
  - ◆ What words were tricky to read?
  - ◆ Why do you think...?
  - ◆ How did you hold the book?
  - ◆ Did you take a breath at periods and commas?
  - ◆ How did the illustrations help?
  - ◆ What do you want to practice a bit more?
  - ◆ What strategy did you use to understand?

◆ What strategy did you use when moving from line to line?

◆ I noticed....

◆ I wonder...

7. Schedule documentation activities at least once a month. Weekly opportunities may enhance student results. It is helpful to draw attention frequently to the new strategies students are learning. One strategy is to take one photo of each student and post them on a bulletin board. Add a speech bubble so each week students can write a learning strategy they learned in reading group. See the textbox, “Documentation Using Speech Bubbles,” for examples.

When engaging in documentation activities, students benefit from having a set of group norms to guide their behavior. Post the norms, review them daily, and refer to them as needed throughout the day. Examples of group norms follow:

- Use kind words.
- Cheer each other as we try.
- Team members help each other.
- All participate.
- We all learn from each other.
- Help others.
- Be kind.
- Work hard.

The textbox, “Documentation Tips,” offers many ideas for integrating this strategy into the classroom.



Documentation Using Speech Bubbles

# Concentration Technique



# Concentration Technique



## What Teachers Can Expect When Using Documentation

Documentation can be a powerful tool, especially in motivating students to become engaged in their reading. It also can be a sustaining system for student reflection and consequential growth.

Following are examples of student responses to typical documentation probes.

**Probe:** What do you do when you are reading?

*If I go out of line I just have to point along to where I was and I'll be okay. Pointing helped me stay in line.*

*You go tap, tap, and sweep! I sound out the word, simple.*

*I was looking at the words so I could read them. I can read when I am looking at the book.*

*The highlighter helps. It helps when I highlight all the words that I know how to read like "the," "to," "is," "cat." Then I know I can read most of the words.*

*You can try to figure out the word. You can go on reading and when you're done with that sentence you can see what makes sense. I reread it when it didn't make sense.*

*I use the pictures. Pictures help me make the story.*

*I noticed that if I remember the periods that I know how to read the words. Periods seem to matter*

## Documentation Tips

- Include only one or two video clips for review at one sitting.
- Use small-group and large-group viewing strategies. Sometimes small groups allow for more voices to think and reflect together.
- Teach students how to record and how to review the recordings. Provide data reflection sheets for them to fill out in order to document their participation.
- Look only at the data that focuses on the learning you want to make visible. In other words, don't worry about using every image or video. It is okay to use a small fraction of what is produced.
- Ask all students the same question. Different perspectives begin to emerge as they learn to share their own points of view.
- Encourage different opinions, ideas, or take-aways from a single image.
- Consider documenting the experience of one small group or learning moment rather than an entire lesson or unit. Ten-second video clips can be very powerful.
- Ask students to think about when and what they should record. The decision-making process can be a learning experience filled with reflection!

*more than I thought. I still don't get commas, I need to figure them out.*

*I could put the words in parts and then put the parts together to make a word. I think that is what I did with the word "funny."*

*The last time I watched myself read I kept on saying "then" instead of "they." Now I say it right. Cool.*

*I think I should show this to my little sister. She would like to listen to this story.*

*I wonder if other kids keep forgetting to use the periods and commas when reading books. I think I want to see how other kids do that.*

**Probe:** What do you notice when you watch other students read?

*She was using her eyes to read.*

*I liked how she reread it. It made more sense to me when I heard her reread.*

*I think she added feeling to her words. They came alive in my head.*

*She broke the words up and stretched them out like a real rubber band or pretending it's a rubber band.*

*She uses her finger to track the words.*

*He stopped and looked at the pictures and then he started to read.*

## Using Documentation When Time Is Short

Documentation can be used in limited time frames. For example, if you only have five minutes, try the following suggestions:

- Take a photo and show students a literacy strategy.
- Use a digital camera or cell phone to capture 30-second clips. Upload clips and let students view them during quiet reading time.
- Add a photograph when explaining how a student reads.
- Allow students to view videos during independent work time.
- Ask students to make a positive comment about what they notice in a one-minute video clip.
- Give students sticky notes and have them write a strategy they

notice in photographs of students reading.

- Teach students to film and download into a file on the computer (Five-year-olds can do this easily.)
- Use a simple protocol for students to self-reflect (e.g., I see...I think...I wonder...).
- Ask students to observe a peer and ask them to write or illustrate two reading behaviors they identify.
- Set up a digital recording station and allow students to use it when reading.
- Ask your student teacher to document learning in your classroom. Make a bulletin board.
- Take pictures and post them next to the rules and strategies posted in the classroom.
- Show parents a photo of their child reading in the classroom.
- Ask students to illustrate a reading strategy.
- Take a photograph once a week and post it on the bulletin board with a comment about the reading strategy.

No matter where, what, or who you teach, creating a learning community is essential to your students' learning. While it is possible to start at any time, the beginning of the school year—when the culture of your

classroom is being established—is normally the best time to begin. Documentation supports a classroom of learners where children and adults look to each other as resources for learning, revisit and improve their

work, and seek the help of others. [For more information, see the Making Learning Visible, Project Zero, Harvard University website at [www.pz.harvard.edu/mlv](http://www.pz.harvard.edu/mlv).]

## Variations and Extensions

- Revisit key video clips with students to increase desired behavior or learning strategy.
- Try documenting another content area (e.g., science, math, social studies, community building, etc.) with your students.
- Organize video clips in personal student folders and allow students to revisit them using key questions and prompts to search and find evidence of certain key learning behaviors or strategies.
- Create a series of video clips about a specific literacy skill and allow the students to share with peers in order to capture another authentic audience.
- Put speech and thinking bubbles with photos that communicate student ideas and opinions.
- Involve students with part or all of the process (e.g., taking photos and videos, jotting down quotes, observing peers and writing observations of good learning strategies, and downloading images and videos into student folders).
- Pair students to review video clips and structure their conversations on positive behaviors and key learning behaviors that they notice.
- Post a note for viewers that explains how individual and group learning occurs.
- Ask students to review peer video clips to learn a new strategy.
- Use with the entire class to prompt a literacy or other content area strategy. Mark progress from the group through video, audio, and image documentation.
- Assign classroom documentarians who can create literacy clips.
- Use the video clips during student conferences to highlight learning and positive behavioral growth.
- Use the video clips during an Individualized Education Program meeting to capture student learning style, achievements, peer interactions, and other positive learning behaviors.
- Consider showing video clips monthly to document literacy growth during the school year.
- Think broadly and apply this technique to other areas of learning. From behavior, to science and mathematics, capturing learning and not just the end product allows for an emphasis and focus on learning rather than on the grade.
- Obtain inexpensive digital cameras that students can use when they notice a learning moment. Active participation leads to increased student engagement in the process of learning.
- Use a microphone if your room tends to be a bit loud. They are inexpensive and can make a difference.

# CHAPTER 4

## Friendship Investigation Teams

### Social Skills Training Teams That Make Learning Visible

**Gina Stefanini**

Adjunct Professor, Wheelock College, and Educator, Brookline Public Schools

Find out how technology-based documentation practices can support students' social skill development.

*He smiles when he enters the room. I think it makes him look friendly. Like he wants to be a friend. Maybe I should try that, too.*



*Why did he laugh when the joke was not that funny. Maybe he did it to be like everyone else or maybe to make the other kid feel good. Let's watch it again.*



*I was thinking about how he sat down and did not make any noises. How did he do that? How do you just sit down and not get anyone to look at you. Can we practice that?*



*Her feelings got hurt. She just came in and those girls laughed. I don't understand what just happened. They laughed, she ran out and changed her face to a crying one. Wow, this one is hard to understand. I think we need to see more of the video clip. Maybe that will help me understand.*

**T**hese types of observations and interpretations are what teachers can expect when using friendship investigation teams with students. Friendship investigation teams serve multiple purposes. They can convey a variety of information and skills, from greetings and problem-solving strategies to game playing and conversing with classmates. These teams use digital documentation practices to uncover some of the most invisible and critical pieces of knowledge that are essential for social understanding

and positive social behaviors. When students become the documenters and subsequent interpreters, they become actively engaged in the content of social learning. This active engagement leads to increased focus, investment, and positive behavioral changes.

Documentation can be described as the practice of observing, recording, interpreting, and sharing the processes and products of learning through a variety of media in order to deepen and extend learning. [For more information, see the Making Learning Visible, Project Zero, Harvard University website at [www.pz.harvard.edu/mlv](http://www.pz.harvard.edu/mlv). Also, see Chapter 3 in this book.]

As educators, we have learned the value of documentation. However, we often do not share the process but only share the consequential learning that comes from thoughtful documentation and interpretation. When we include the other members of the learning community, namely the students, then documentation practices not only serve the teacher but they also extend to the entire learning group. More specifically, when we allow students to observe, record, and interpret, we allow them to deepen and extend their own learning. When we include a variety of media and student learning styles, then we make the documentation available for student observation and interpretation.

The purpose of this chapter is to describe an approach, friendship investigation teams, that helps students understand appropriate behavior. The approach uses common technology tools to engage students in observing the behaviors of other students.

## About Friendship Investigation Teams

Friendship investigation teams build an understanding of how school communities function at the classroom, small-group, or peer level for students. This documentation practice also helps students to understand and apply their classrooms' invisible and subtle social norms. Friendship investigation teams:

- Communicate and create a learning environment for social understanding and applied practice.
- Make individual thinking available to the group and support collective knowledge building.
- Help learners make connections and generalizations about social norms and behaviors.

Inside and outside the classroom, these investigation teams use digital media (video and photos, audio, and text scripts), collaborative teams, and essential rehearsal opportunities to make social learning visible.

Teams pursue the interests and social skill sets of the student group. The students are the recorders of the

essential social practices that they are investigating, and the students bring this documentation back to their group to review, practice, and adopt the appropriate social practices. The key elements to this approach are:

- Student-driven focus.
- Student reflection.
- Student adoption of authentic student behaviors in their current environment.

These groups capture the social values and practices of their community, provide a place for reflection, help learners make connections within and across social groups, and contribute to a shared and public body of knowledge.

Friendship investigation teams also can foster a sense of belonging to the entire school community. New understandings, coupled with coached rehearsals and reflections, provide the building blocks for positive behavioral and social changes within teams and among individual participants. Students have the blueprint and practice needed to apply their knowledge in their community.

Friendship investigation teams that make learning visible focus on the social knowledge discovered, what specific behaviors should be learned, how that behavior should be learned, and how students can apply that skill and/or knowledge in their day-to-day lives. The teams and their documentation practices reveal the



social learning process as well as the behavioral products of improved social behaviors. They often include an experienced adult facilitator, video equipment, a small cohort of students, and weekly/bi-weekly group sessions. Social investigation teams span the range from short-term and dyad groups to larger, multi-year cohorts with varying ages and skills sets.

If possible, try to find a colleague with whom to work or check in with when you need feedback. Include parents if possible and share with fellow colleagues who may have opportunities to reinforce new skill sets. Celebrate student successes and attempts and know that social mishaps come with the territory when taking social risks by trying new social behaviors.

## Procedural Guidelines

**Identify a small cohort of students and communicate the purpose of the approach.** Start with one small group. It could be an established social skills group or a small group of students whom you believe may be able to work together. It is essential that you and the students experience a sense of success, so do not start with your most challenging students. You need to practice these new techniques with basic social topics and behaviors before you attempt more challenging skill sets. The group can be as small as a dyad, but little work will be accomplished with groups of more than five.

### Tips to Make This Work

- Beware of including too much content; simple is best. Many groups often start with the smile.
- Ask yourself, "What is the learning we want to make visible?" if you are feeling adrift in a sea of data.
- Use short, 10-15-minute sessions. Choose frequency over duration.
- Provide immediate playback. Delaying student process does not increase their connection or motivation to work on these challenging skills.
- Think about providing an authentic audience with whom students can share their ideas.
- Make sure that the images (videos or photos) are student driven and show students engaging in authentic or practiced social situations.

**Secure permission from administrators, parents, and students.** This may be done as part of the IEP process or through a letter of participation that is sent home for parental signature. It is helpful to have a conversation with the parents about the new technique. Students often become excited about the work and relay the information to family members without the essential context and goals. Clarification has been a key to family approval and collaboration.

It also is helpful to communicate about this new social skills practice with colleagues and administrators. A short conversation with an example is often the best way to share the initial idea with colleagues. They may have many questions about where the videos are stored, who sees them, how they are deleted, and why they are needed. Following is an example of a brief description that would be relevant for colleagues, parents, and administrators:

*I have a social skills group that meets for 20 minutes a week on Tuesdays and Thursdays. They are fifth grade students who continue to struggle with the expected social norms at school, and I have exhausted the usual social skills practice techniques. I am so committed to their success that I would like to try a new technique that involves students as social investigators who document, reflect, and practice "real life" social practices of their community. It is an exciting new proposal that supports student interests as I (the teacher facilitator) guide them to essential social norms and positive social strategies. This group will capture those unspoken social rules of our community, review and reflect on their documentation, and then use video to practice and reflect on their own implementation of the strategies. The videos will be used only during our sessions and will be deleted once they are no longer needed. All documentation will be kept securely on my computer (hard drive, thumb drive, server account) and parental permission for participation will be secured prior to participation.*



**Obtain a digital camera with video capability.** Students will need to film the social behaviors so obtaining a camera that allows for student use is imperative. Check with your school librarian, technology teacher, PTO, and/or parents of the cohort for available technology tools. Or, consider asking for donations from families, colleagues, PTO, and/or local shops. You also may check sources that sell used equipment at low cost (e.g., eBay). High-quality cameras are not essential to this work, but the camera you choose does need audio and video features. Familiarize yourself with the basic features and provide students with sufficient practice time before going out into the field for research and filming.

**Find a place and time to meet.** This work requires a small environment that allows for role play, filming, and playback. A small classroom, guidance office, or back room would be a perfect environment. Your students will want to be assured that they will not be disturbed and their work will not be viewed by others (this is especially so with older elementary students and teens). A sign outside the door—such as “Video production, do not disturb!”—can help ease student concerns about being disturbed or their work viewed without permission.

These sessions can be short (e.g., 15-30 minutes) but you need a way to project the videos and images. A

computer is perfect, and a laptop gives you flexibility in location. Short, concentrated sessions are often very effective if you can meet a few times a week. With shorter periods of time, students will leave the activity with a positive level of heightened interest. Leaving them wanting more and returning to the work frequently appears to support the work more effectively than is the case with longer, less frequent sessions.

**Start small and simple.** Students can use still photos and very short video clips to capture a social moment that they would like to investigate. First, use photos and then move to very short (10-30 second) video clips. For example, a photograph of standing in line or waiting a turn to speak with the teacher can provide documentation for the students to use.

Students might begin their documentation practice with still photographs that limit the amount of input they need to absorb and apply. Very quickly, the students will seek more input and want very short videos to capture and review for implementation practice. For example, students may want to document how to start a game, how to join a group in the cafeteria, or how to ask the teacher for more time. These social moments that they capture in their natural school environment become living artifacts and tools they can use to learn and apply unwritten social norms.

**Use questions that provoke thinking, greater understanding, and investment in the learning.** Questions that make students feel they are wrong or do not understand something will not support learning. Your questions should support an instructional model of discovery, student empowerment, and better understanding. Examples of reflective questions and profiles follow.

- What kind and friendly words did you notice? Let's make a list of what you heard. We will watch the video three times to help us make the list.
- Let's think about tone of voice. What did you notice? Who used a friendly tone? How did his friend respond to that friendly tone?
- Let's watch faces this time. We are going to look at facial expressions. We will watch her eye areas and mouth when we look at her facial expressions. Let's see what we notice.
- What body movements did you notice? Was she close or far away when she spoke? Was her body moving? What kinds of moves did you notice? Let's think about how those expressions helped the conversation.
- Today you chose to film how students play a board game without getting too angry when they lose. Let's see how the game ended. What friendly behaviors did you notice? What words were used to end the game? Which words sounded friendly?
- When would you use this friendly statement? Let's practice.

- When could you see yourself wanting to try that friendly behavior? Let's practice.
- How many times did she smile during the game? She was smiling even when she was losing.
- Why do you think ...?
- Who is leading the conversation? Let's watch it again to see how he started the conversation.
- Where could that behavior (describe it and show it on the video) be successful?

It is helpful to display students' new learnings visually. One technique is to use photographs with sound bubbles. [See the textbox, "Example of How to Display Student Learning."]

**Establish group norms.** Positive group norms that are practiced and reviewed at the beginning of each session help to establish a sense of trust and cohesion. Simple is best; no more than four norms seems to work best. Some examples include:

- Work hard, be kind, and help others.
- Include everyone, value our work, and respect each other.
- We are a team. Team members help each other and make sure all can participate.
- We use kind words. Everyone gets to feel safe.

[See the textbox, "Group Norms," for an example.]

**Devise a meeting agenda to use during each session.** A meeting agenda is a list of consistent activities that become

the group's expected experiences. This routine becomes the foundation of your work. Changes in the agenda require preview and practice. Post the agenda and review it at the beginning of each session. You may have two kinds of agendas—investigation sessions when you are out in the field filming, and practice sessions when you are using the video. Examples of possible agenda items follow.

- **Greeting.** Students should have a practiced set of ways to greet each other. Introduce new social greetings and have the group document social greetings from the school that they may want to practice.
- **Read the meeting agenda.** Reading the agenda each time organizes the work and supports the continuity of the group.
- **View video clips (old or new).** Using and reusing previous videos can be very powerful. Students begin to reflect deeply and notice small moves or behaviors that make the social interaction work. The video holds a place in time that your students can revisit again and again. The images also allow for a shared experience among group members, since they all can see the specific visual perspective.
- **List the friendship behaviors.** As students view the clips they will begin to notice behaviors. List or draw (depending on literacy level) what they notice (e.g., smile, hand on shoulder, eye contact, tone of voice, head tilt, laughter, etc.). Students also will want to participate in this process. Reviewing the same clip will allow students to engage in dialogue, since they can revisit a moment again and again. Students often will find specific behaviors of interest (e.g., head tilt,

kind of smile, conversation starter, etc.) that they would like to try themselves.

- **Choose behaviors to rehearse.** Students should have the deciding voice. Personal investment and interest are key elements to this technique. Supportive guidance is beneficial, but be aware not to steer the work toward your personal preferences.
- **Practice.** Allow students to practice, practice, and practice using the video to capture behavior, review documentation, and practice more.
- **Make a plan.** Simple plans are best, especially in the beginning months of the group. These could include smiling at the teacher when you say good morning, asking for help in a calm tone, starting a conversation, etc.
- **Close the meeting.** A consistent ending ritual that focuses on the positive experience of the group ties the group together and leaves students with a sense of community.

## In Conclusion

Friendship investigation teams can be developed for a variety of students and with many audiences in mind. Making the work authentic and meaningful and providing a real audience for their new understandings and videos can capture and sustain student interest. Always ensure that their interest, involvement, and products are central to the work.

These groups can function year round in the smallest of arenas, but they

Example of How to Display Student Learning

# LISTENING TO MY TEACHERS



WHEN MY TEACHERS ASKS ME TO DO SOMETHING, I HAVE TO DO IT



I MAY NOT WANT TO DO WHAT MY TEACHER TELLS ME TO DO, BUT I STILL HAVE TO DO IT



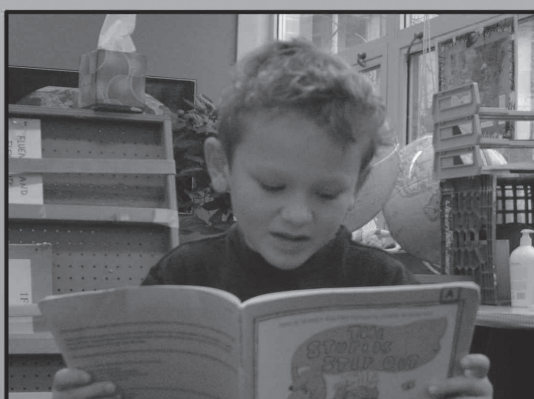
WHEN MY TEACHER ASKS ME TO DO SOMETHING I CAN THINK TO MYSELF



AND IF I LISTEN TO MY TEACHER WHEN SHE WANTS ME TO DO SOMETHING . .



. . . AND I DO IT REALLY QUICKLY . . .



. . . I CAN GET BACK TO WHAT I WAS DOING IN NO TIME!



Group Norms

# 1SC CLASS RULES

1. Keep a calm and safe body
2. Use kind words
3. Use all materials the right way
4. Try your best
5. Have fun!

I Promise to try to follow the rules

Ms. Starr  
 ELIXANDRA  
 KARENO  
 TAMILA  
 ASHLEY  
 EMILY  
 DOZHU  
 PAUL  
 ANDER  
 DURIJOY  
 NATE  
 REESE  
 NATALIE  
 LOCO  
 MS. HAYES  
 AILEY  
 JASPER  
 GABRIELE

need a cohort and facilitators who are willing to allow for student interest, authentic learning, and frequent short working sessions to ensure that their new social understandings are understood and can be employed directly in their community. Involvement with key adults and the acknowledgement that learning these very challenging social behaviors may not always be easy (they will make mistakes along the way) can provide learning moments. Enjoy the process with the students, involve administration (especially in their triumphs), and allow the team to reach out and share their new knowledge in authentic ways (e.g., making a video, producing a newsletter, sharing at a parent premier, starting up another investigation team, or creating a blog or wiki).

## Variations and Extensions

### Try...

- Revisiting key video clips with the learners.
- Creating a series of video clips about specific social understandings.
- Putting speech and thinking bubbles with photos.
- Involving students in making the video stories (e.g., gathering information, taking pictures/videos, and jotting down quotes, etc.).
- Pairing with another classroom to view and respond to the video clips/photos.
- Including other educators.
- Asking students to give their peers a "walking tour" of their video clips.
- Using clips with the entire class to prompt a positive behavioral change.
- Assigning classroom documentarians who capture the good work of their peers.

### If you only have five minutes try...

- Taking photos or using old photos during friendship investigation team meetings.
- Using a previous video clip.
- Using recess or break time to allow students to capture video and photos.
- Meeting for a few minutes as frequently as possible.
- Using a cell phone to capture a short video.
- Asking an assistant to record a clip and use it for a quick check-in session.
- Using web photos and videos as tools for social learning.
- Sharing one photo with a student.

# CHAPTER 5

## Technology and Web 2.0 Strategies for Executive Functioning

**Karen Janowski**

Founder EdTech Solutions (Reading, MA), and Faculty Member, Assistive Technology Graduate Program, Simmons College, Boston, MA

*She doesn't know where to begin.*



*He's paralyzed by writing assignments.*



*It takes hours for her to finish her homework. And when she does finish it, she loses it and doesn't pass it in.*

Parents and teachers often express frustrations when describing the performance of students with impaired executive skills, which are necessary for successful school performance. Executive skills allow us to plan and organize tasks, sustain attention, and persevere to complete a task.

The first generation of the Internet allowed anyone to access content. Creating online content was a time consuming process that required specialized skills (e.g., knowing how to use HyperText Markup Language, or HTML). Web 2.0, also referred to as the Read/Write Web, broke new ground. It made HTML knowledge unnecessary. Now, it was possible to not only access content, but to create it as well; to create online content and collaborate with others anytime and anywhere. The most well-known early examples of the paradigm shift in Internet use were Wikipedia and YouTube. They paved the way for an exponential growth in Web 2.0 sites that allowed users to create, collaborate, and connect.

Learn about how instructional technology and Web 2.0 strategies can enhance learning for students, including those with learning challenges.



With the advent of Web 2.0 came new methods to reach struggling learners. The purpose of this chapter is to identify Web 2.0 tools that address the challenges faced by students with executive skill deficits. The intent is to provide the reader with a variety of tools and strategies to help learners overcome executive skill challenges.

## About Executive Functioning

A precise definition of executive function skills remains elusive at this time, as neuropsychologists recognize the complex interrelationship of multiple cognitive functions (Reynolds & MacNeill, 2008). However, many experts identify the components of executive functioning as including five main skills:

- **Planning.** The ability to create a means to achieve a goal or complete a task.
- **Organization.** The ability to coordinate things effectively.
- **Time management.** An awareness of time and how to manage it to complete tasks within time constraints.
- **Working memory.** The ability to hold pieces of information together mentally and accomplish something purposeful. Intact working memory makes math computations, spelling tasks, reading comprehension, and note taking less challenging.
- **Metacognition.** The ability to analyze one's learning, to self-monitor,

and to make adjustments when necessary.

An interconnected relationship exists among these five skills for intact executive functions.

Another way to think about executive functioning comes from the work of Horowitz (2007), who describes the term as follows:

- Is conscious, purposeful, and thoughtful.
- Involves activating, orchestrating, monitoring, evaluating, and adapting different strategies to accomplish different tasks.
- Includes an understanding of how people tap their knowledge and skills and how they stay motivated to accomplish their goals.
- Requires the ability to analyze situations, plan and take action, focus and maintain attention, and adjust actions as needed to get the job done.

Students encounter demands on executive skills on a daily basis. These include ability to initiate, plan, and execute a task in an independent manner. The demands are fewer at the elementary level, but they increase as students progress through middle and high school. This parallels the natural development of executive functions. They are nonexistent at birth, begin to develop through infancy, and continue to develop through childhood and adolescence, and through the beginning of the third decade (Dawson and Guare, 2004). Executive skills are crucial to the monitoring, planning, and evaluating

of adaptive behavior through the life span.

For example, throughout the school day students need to be able to:

- Initiate, plan, and organize their work.
- Record homework.
- Strategize long-term assignments.
- Remember the steps necessary to complete math problems.
- Use effective study skills.

Unfortunately, for too many students, the development of effective executive skills does not occur.

What does a student look like who uses executive skills in a typical classroom? Let us consider a composite of such a student.

*Lisa is a sixth grade student who arrives at school toting her backpack filled with color-coded notebooks and folders. She walks to her locker, retrieves the textbooks needed that morning, and removes unnecessary folders and books, placing them on a locker shelf. As she enters each classroom, Lisa easily locates her completed homework and places it on the teacher's desk, as she does every morning, according to teacher expectations. She attends to teacher instruction in each class and records notes in the appropriate folders. She incorporates the two-column method of note taking she was taught at the beginning of the school year and has customized it in a way that works best for her. She participates in class discussions, as she completed the readings assigned the previous night and is confident in her understanding of the material. Lisa enjoys the lunch break,*

*as it affords her the opportunity to socialize with her friends and take a break from academic expectations. Her performance with her afternoon schedule is similar. She is able to write all homework assignments in her agenda, the paper scheduler provided to all middle school students in her school. She finds the tips and additional study skill information helpful as she plans her afterschool schedule.*

*That night, Lisa reviews her assignment notebook and tackles the homework she must complete. She creates a checklist to guide her work. Fortunately, the math class website includes a link to a review of teacher instruction. Lisa manages her time effectively and finds she has sufficient time to watch the review link to help her better understand the math concepts taught that day. Two hours later, Lisa checks off the last task on her to do list and spends time texting her friends. With her family, she watches a favorite television show, which she had prerecorded. Finally, she gets ready for bed. It has been a hectic day but she feels a sense of accomplishment as she reflects upon her time at school.*

Conversely, let's examine a day in the life of a student with executive function challenges. Again, this is a composite picture:

*Sarah, a ninth grade student, arrives at school after the tardy bell, not an unusual occurrence. She is late because she frantically, but unsuccessfully, tried to locate the math homework she completed for her first period class. She fares no better during her second period class, English. The homework assignment required Sarah to write a two-page essay, an analysis of a book the class had just finished reading. Unfortunately, she found*

*it impossible to get started and was only able to type two paragraphs. Sheepishly, she places her essay on the teacher's desk, face down, so her friends cannot see what she has done.*

*After second period, Sarah reports to the learning center. Together with her learning center teacher, she empties her backpack, a weekly ritual to help her better organize the numerous worksheets and papers she collects during the week. She wonders why she can't develop an organizational method that works for her. Consequently, each class is a constant reminder of her organizational difficulties; she has difficulty retrieving the packets of information her teachers give her at the beginning of the week.*

*In her social studies class, the teacher lectures about the Sumerian City State, part of the Ancient Civilizations unit they are studying. Sarah finds note taking especially challenging. She cannot always determine what is important to record. Sometimes she tries to write everything her teacher says; then, she misses too much of the lecture. At the end of the school day, she hangs out with friends for a few minutes. When her mother arrives to pick her up after school, she collapses in the car, frustrated and exhausted by the challenges she has faced. The thought of the homework assigned for that night reduces her to tears. She has no idea of how to begin the month-long project assigned in her science class.*

Do you recognize these students?

Intact executive functioning reflects productivity, organization, effective time management skills, and flexibility. If one method is not working, there is always a Plan B that is worth

considering. Executive function challenges reflect difficulties initiating, planning, and/or executing a task; poor use of time; and ineffective problem solving and strategy use. Students who present with executive function challenges often are unable to learn from experience. They are destined to repeat ineffective approaches unless intervention or remediation is offered.

## Interventions

Dawson and Guare (2004) recommend interventions that focus on strategies at the environmental level (provide external structure and support) or at the individual level (explicit individualized strategy instruction). Examples of environmental level supports include:

- Verbal cues or prompts.
- Preferential seating away from distractions and close to the teacher.
- An end-of-the-day assignment notebook check in with Learning Center support staff to ensure they have accurately documented homework assignments.

Interventions at the individual level require explicit instruction, which is a more systematic approach. The intervention often includes identifying a behavior to modify, and it outlines steps to achieve success. It may include the use of reinforcers or incentives and a behavior contract. Time for the individual to internalize the strategy often is required.

Accommodations listed in the Individualized Education Program (IEP) provide environmental support necessary for success. Sample accommodations frequently used by IEP teams include:

- Provide opportunities for previewing and reviewing of material.
- Minimize the amount of paper for which student is responsible.
- Review assignment notebook at end of day.
- Color code folders.
- Use online calendar to organize assignments.
- Put all content and homework in a digital format for ease in organization.
- Use graphic organizers, including computer-based options.
- Use checklists and templates, including computer-based options.
- Provide a dedicated laptop customized for student's use. Customization should include desktop folders organized by subject and use of appropriate notes, to-do lists, or stickies software.

In addition, students often are assigned study skills classes in the learning center, an ideal environment to expose students to the use of Web 2.0 tools, which offer alternative instructional methods. The Read/Write Web allows students to access content and to create content and collaborate with others. It is an interactive platform with powerful possibilities.

The advantages of Web 2.0 tools are many. Students can easily collaborate with others, create online content, and connect with peers or educational staff. They are able to use the technology tools with which they are familiar. They can connect anytime and anywhere using portable mobile devices, smartphones, or computers. Everyday technology offers access to tools that alleviate executive dysfunctions.

There are several advantages to the use of technology solutions. Technology is flexible, multisensory, and portable; it is often engaging; and it can be customized to the needs of the learner. Technology solutions offer multiple methods of engagement, presentation, and expression—the essential principles of Universal Design for Learning (UDL). Creative solutions to the challenges faced by students with executive function skills have the potential to benefit all students. It is essential that educators offer a variety of options. We can no longer limit students to the tools of the 20<sup>th</sup> century.

The textbox, “Traditional and Web 2.0 Methods of Executive Support,” reviews traditional methods of executive function support and Web 2.0 options.

## Implementing Web 2.0 Tools

To expand upon implementation, let's explore three specific areas:

- Time management skills.
- Memory skills.
- Written language skills.

### Time Management Skills

Time management frequently confounds students with executive function deficits. The ability to perceive the time required to complete a task may be poorly developed. For example, students may anticipate that an assignment will take 20 minutes to complete, when, in actuality, it will take more than two hours. To help develop the time perception ability required to complete specific tasks, students may want to use a tool such as Time Tracker 2.0 ([www.formassembly.com/time-tracker/](http://www.formassembly.com/time-tracker/)). [See Figure 1 for a screen shot.] Time Tracker is an easy-to-use online program that records and offers a visual summary of time on task. Students compare an estimate of the time required to complete a task with the actual timed record. An objective record of time required provides valuable information in a student's quest to develop accurate time management skills.

### Memory Skills

Memory issues are especially problematic for some students. Numerous tools provide support to overcome problems with remembering assignments, steps to complete a math problem, or information for a test or quiz. Use tools such as Vocabro

## Traditional and Web 2.0 Methods of Executive Support

Task	Traditional Strategy Approach	Web 2.0 Alternative/Technology Solutions
<b>Record homework</b>	Assignment notebook	<ol style="list-style-type: none"> <li>1. Record assignment on class website.</li> <li>2. Audio record assignment using Vocaroo (<a href="http://vocaroo.com">http://vocaroo.com</a>) and email to all students.</li> <li>3. Use online assignment and planner/scheduler tools such as: Track Class (<a href="http://trackclass.com">http://trackclass.com</a>). Soshiku (<a href="http://soshiku.com">http://soshiku.com</a>). Notely (<a href="http://www.notely.net/">www.notely.net/</a>).</li> <li>4. Use Google Apps for Education (<a href="http://www.google.com/educators/p_apps.html">www.google.com/educators/p_apps.html</a>).</li> </ol>
<b>Study for quizzes or exams</b>	Create paper-based note cards or study guides	<ol style="list-style-type: none"> <li>1. Use online flashcard generators (e.g., <a href="http://udltechtoolkit.wikispaces.com/Study+skills+tools">http://udltechtoolkit.wikispaces.com/Study+skills+tools</a>) to track learning.</li> <li>2. Create a Google Doc for collaborative studying (<a href="http://docs.google.com">http://docs.google.com</a>). Invite peers and type questions with real-time answer documentation.</li> <li>3. Use Skype to study with peers.</li> </ol>
<b>Initiate and complete homework</b>	Give students a homework assignment	<ol style="list-style-type: none"> <li>1. Use audio cues on cell phone to start task.</li> <li>2. Use TimeTracker (<a href="http://www.formassembly.com/time-tracker/">www.formassembly.com/time-tracker/</a>) to identify how long specific tasks take to complete. Use that information to guide future homework tasks.</li> <li>3. Use calendar functions on cell phones or online calendars such as Google Calendar (<a href="http://www.google.com/calendar/">www.google.com/calendar/</a>).</li> </ol>
<b>Research</b>	Use Google	<ol style="list-style-type: none"> <li>1. Track search results using SpringPad (<a href="http://springpadit.com">http://springpadit.com</a>) or EverNote (<a href="http://evernote.com">http://evernote.com</a>).</li> <li>2. Use Diigo, a social bookmarking tool, to tag search results by subject, add highlighting and annotations, and extract annotations as necessary (<a href="http://www.diigo.com">www.diigo.com</a>).</li> <li>3. Save web links for research projects into a Livebinder, an online binder creation tool that embeds the web page directly into the tabbed page (<a href="http://livebinders.com">http://livebinders.com</a>).</li> </ol>

(<http://vocaroo.com>) (see Figure 2 for a screen shot), or Fotobabble ([www.fotobabble.com](http://www.fotobabble.com)) to record directions for homework completion. Vocaroo offers only one option, a record feature, and teachers record specific directions for students to follow at home. The audio can be downloaded

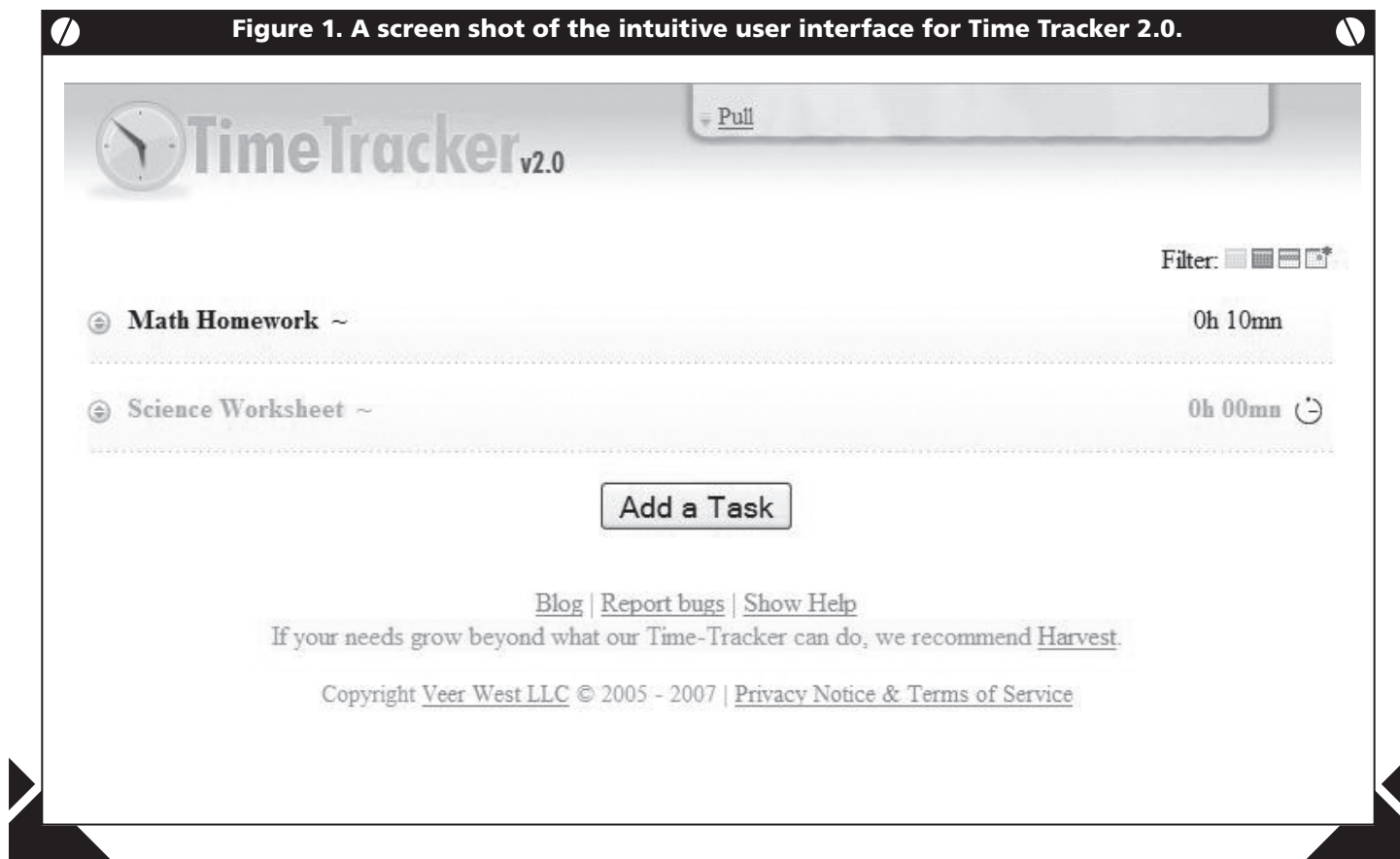
as a .wav file emailed to students, or embedded in a web page. Fotobabble users upload an image and record audio for students to review at home.

Voicethread (<http://voicethread.com>) provides math teachers a way to record their teaching of a math

concept or the steps necessary to complete a math problem. This can be especially beneficial for students who may understand the concept at school, but struggle to recall the process when they need to complete math homework later. This is one method for creating MathCast



Figure 1. A screen shot of the intuitive user interface for Time Tracker 2.0.



or videocasts that allow for math instruction review.

Electronic flashcard tools offer innovative methods to study material. For example, Quizlet (<http://quizlet.com>) (see Figure 3 for a screen shot), offers several options: Flashcard Mode to become familiar with material, Learn Mode or study mode to keep track of scores, and Test Mode which generates customizable tests. Additional flashcard tools can be found at <http://udltechtoolkit.wikispaces.com> (see Figure 4 for a screen shot) under the Study Skills link.

There are multiple ways to use these tools to bypass memory issues. What is empowering is that students are in control of how often they review the material to ensure understanding.

## Written Language Skills

Students with executive skill challenges often struggle with the writing process. Identifying the topic, initiating the writing assignment, planning the writing process, and recalling and organizing ideas into a coherent product can all be daunting tasks. Students are taught to use the writing process, which is a five-step method:

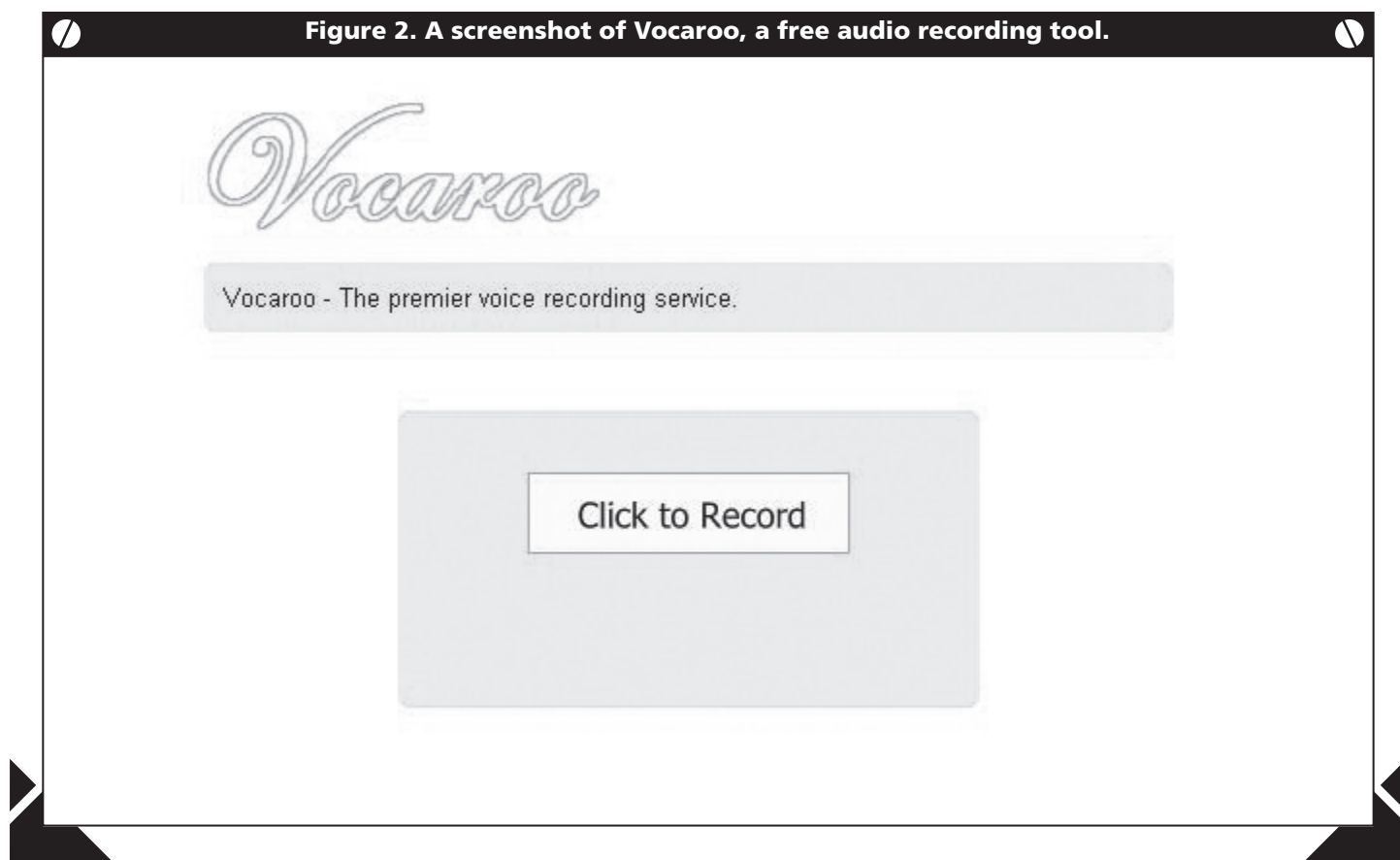
- Prewriting/brainstorming.

- Drafting.
- Revising.
- Editing.
- Publishing/sharing.

Additionally, there are five main types of writing: expository, descriptive, persuasive, creative, and narrative. Students are asked to complete a variety of writing assignments as they progress through the educational continuum from kindergarten to high school graduation.

What are the traditional methods employed by English language arts teachers? Do alternative options

Figure 2. A screenshot of Vocaroo, a free audio recording tool.



exist that better support students with executive function skill challenges who struggle with the writing process? The textbox, “Five-Step Writing Process,” describes traditional approaches for each stage of the writing process and proposes technology alternatives.

Web 2.0 tools offer new opportunities. For example, teachers frequently model a variety of learning strategies in their classroom. The use of Type with Me (<http://typewith.me>), Primary Pad (<http://primarypad.com>) (see Figure 5 for a screen shot) or Titan Pad (<http://titanpad.com>) free online word processing tools provides

a unique opportunity for teachers to model the writing process. Using any one of these tools, a teacher can create a paragraph and later demonstrate how he or she formulated the paragraph using the built-in Time Slider feature. The Time Slider plays a video of how the writing evolved. The playback reveals how the teacher revised and edited the work by correcting spelling or grammar, moving or replacing ideas, or changing vocabulary. It can be especially beneficial for a student with executive skill deficits to observe how written language evolves; it is a process demystified by the use of the Time Slider tool. Explicit strategy instruction is

an essential component of effective interventions that promote executive functions.

Finally, Web 2.0 tools continue to develop and evolve. The reader is encouraged to view resources at <http://bit.ly/executivefunctions>, a website that is updated frequently to reflect current options and that is used in professional presentations.



## INTEGRATING TECHNOLOGY TOOLS INTO INSTRUCTION

### Five-Step Writing Process

Step/Description	Traditional Strategies	Technology Solutions
<b>Prewriting/brainstorming</b> Determine topic, brainstorm ideas, and identify audience.	1. Use paper-based graphic organizers or concept maps. 2. Use sticky notes.	1. Use online graphic organizers such as Bubbl.us ( <a href="http://bubbl.us">http://bubbl.us</a> ) or Webspiration ( <a href="http://www.mywebspiration.com">www.mywebspiration.com</a> ) 2. Use Read/Write/Think Webbing Tool ( <a href="http://interactives.mped.org/view_interactive.aspx?id=127&amp;title=">http://interactives.mped.org/view_interactive.aspx?id=127&amp;title=</a> ). 3. Use Read/Write/Think Story Map Tool ( <a href="http://www.readwritethink.org/files/resources/interactives/storymap/">www.readwritethink.org/files/resources/interactives/storymap/</a> ).
<b>Drafting</b> Research, write ideas, and organize information. The emphasis is on content; the form does not need to be perfect.	Record information on notecards. Transcribe notes to paper to create first draft. <i>Note:</i> This step may be handwritten or word processed.	Collect information and resources using: NoteStar ( <a href="http://notestar.4teachers.org/">http://notestar.4teachers.org/</a> ). Zotero ( <a href="http://www.zotero.org">www.zotero.org</a> ). Evernote ( <a href="http://www.evernote.com">www.evernote.com</a> ). 2. Create draft using Google Docs.
<b>Revising</b> Refine the written product.	Use peer editing and adult support.	1. Listen to written product using text-to-speech. Make adjustments and rearrange sentences to improve flow of ideas, right click individual words for synonym support. 2. Share Google Doc link with peer or adult for synchronous revision. Use side window chat for interactive, collaborative revision. 3. Review the revision history in the Google Doc to see how the document evolved.
<b>Editing</b> Evaluate mechanics (e.g., spelling, capitalization, and punctuation).	Use paper-based checklists or rubrics.	1. Create a customized checklist ( <a href="http://pblchecklist.4teachers.org">http://pblchecklist.4teachers.org</a> ). 2. Use Paper Rater ( <a href="http://paperrater.com">http://paperrater.com</a> ) for online paper analysis including spellchecking, grammar checking, plagiarism detection, and word choice. <i>Note:</i> This is appropriate for middle school and above.
<b>Publishing/sharing</b> Share the final product.	The teacher reviews the final product.	1. Publish to a blog or wiki. 2. Publish using Google Apps for Education; share links to Google Docs or Google Sites.

## Putting It All Together: Writing Supports for Amanda

Amanda is a high school freshman who is challenged by the editing process when she attempts to complete written assignments. No matter the content area, she typically fails to edit her work effectively and her grades reflect that failure. In fact, she handed

in her last English paper without editing her work.

Her academic support teacher plans to introduce new strategies to help her improve her editing skills. Together they develop a plan, which Amanda will implement when she is required to edit and revise her work. The plan is:

When Amanda is ready to edit her work, the first step requires that

she create an editing checklist with her academic support teacher using the free online tool, PBL Checklists (<http://pblchecklist.4teachers.org>). Once they access the website, they will select the appropriate subject area (writing) and grade level (9–12) (see Figure 6). They will name the checklist and follow the directions to “Create a Printable Checklist.” Once the checklist has been created, it can either be printed or emailed to

Figure 3. A screenshot of Quizlet, an electronic flashcard generator

The screenshot shows the Quizlet website interface. At the top, there is a navigation bar with links: Home, Features, Find Flashcards, Make Flashcards, Help, and Blog. The main heading reads "The *best* way to study languages, vocabulary, or almost anything". Below this, a subheading says "P.S. It's fun, it's free, and you can share with friends!". There is a search bar with the text "Find something to study..." and a "Make Flashcards" button. To the right, there is a "See how it works" link and a small video player. Below the search bar, there are two sections: "Quizlet's also great for..." which includes "Mobile Studying" (with a smartphone icon) and "Teachers" (with an apple icon); and "Try it out: Basic Chemistry" which shows a sample flashcard set. The sample set includes a question "substance containing two or more elements chemically combined in a fixed ratio" and an answer field "Type 'compound' here". There are also counters for "Remaining" (5), "Incorrect" (0), and "Correct" (0). A "Give Up" button is also present. At the bottom, there is a section for "Hot sets today".

Figure 4. A screen shot of the UDL Tech Toolkit wiki.

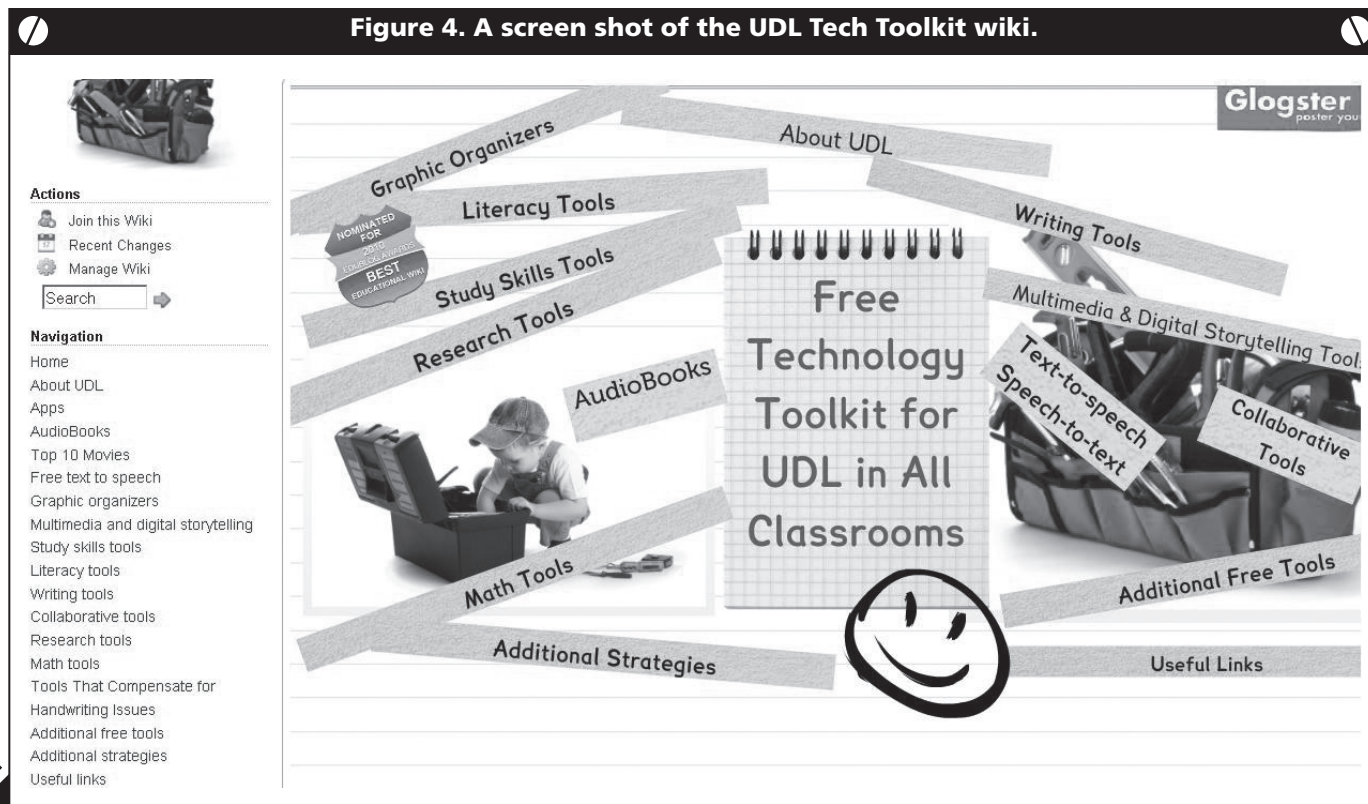


Figure 5. A screen shot of Primary Pad highlighting the Timeslider feature.



Amanda. She will use this as a guide as she completes the subsequent steps of her editing plan.

Next, she will use a spell checker and grammar checker to correct errors. She will right mouse click anywhere within the words that are flagged as grammatical or spelling errors and make the appropriate corrections.

Then, Amanda will right click to access synonym support to improve the quality of her word choices. She finds this especially beneficial since she frequently avoids incorporating more challenging vocabulary due to spelling difficulties.

Amanda will use any text-to-speech program to listen to her written work. She will listen, one sentence at a time, and correct any content errors. She will ensure that the changes she made using spell check, grammar check, and synonym support make sense within the context of her writing. Next, she will listen to one paragraph at a time to ensure her writing reflects what she intended to write and demonstrates connections within the paragraph. For a list of free text-to-speech options, please access the UDL Tech Toolkit wiki (<http://udltechtoolkit.wikispaces.com>)

After that, Amanda will use PaperRater (<http://paperrater.com>), a free online text analyzer. She will copy and paste her work, add a title, check what type of paper it is, agree to the terms of service, and select "Get Report." She will follow the directions to edit her work and make suggested changes if she agrees with them.

Finally, she will listen to the written product once more and determine if she is satisfied with the quality of her work.

After completing these six steps, she will submit her paper for review with her academic support teacher.

**Figure 6. A screen shot of the PBL Checklist site.**

**PBL** Project Based Learning

Checklists to support Project Based Learning and evaluation

*A project based learning method is a comprehensive approach to instruction. Your students participate in projects and practice an interdisciplinary array of skills from math, language arts, fine arts, geography, science, and technology.*

*"The collaborative nature of the investigation enhances all of these valuable experiences ... as well as promotes a greater appreciation for social responsibility (Scott, 1994)."*

Building Motivation  
Using Multiple Intelligences

**PBL Checklists**

**writing**  
K-1 2-4 5-8 9-12

**science**  
K-4 5-8 9-12

**oral presentation**  
2-4 5-8 9-12

**multimedia**  
2-4 5-8 9-12



Together they will assess it and make any additional changes necessary.

## Putting It All Together: Study Skills Supports for Emily

Emily is a 10th grade student who receives specialized instruction due to her executive function skill deficits. In her weekly study skills class, she works to develop independent executive function skills for school success. Her backpack is overflowing with textbooks, folders, notebooks, and unfiled papers. In addition, she frequently misplaces her assignment notebook. One of her IEP goals is to develop effective organizational skills to help her manage her schoolwork and the paper that accompanies class assignments.

### External Supports

The school staff decides to explore innovative methods to record homework and to distribute worksheets as they begin a new school initiative. The school administration has made a commitment to move to a paperless environment. They believe this approach benefits all students. Every teacher manages this differently, which allows Emily the opportunity to develop a system that works best for her. Consider the following examples.

The English teacher types the assignment in the class Google Calendar

that is embedded in the class wiki. At home, Emily accesses the class wiki and reviews the assignments for that day. [Information about free wikis for educators can be found at [www.wikispaces.com/content/for/teachers](http://www.wikispaces.com/content/for/teachers). An excellent tutorial is available at [www.freotech4teachers.com/2009/08/how-to-week-day-1-using-wikispaces.html](http://www.freotech4teachers.com/2009/08/how-to-week-day-1-using-wikispaces.html).] To embed a Google calendar in the class wiki, the teacher completes the following steps:

- In the calendar list on the left, click the down-arrow next to the calendar you want to embed, and select Calendar settings. (Alternatively, click the Settings link at the bottom of the calendar list, then click the name of the calendar.)
- Copy the iframe code displayed in the Embed This Calendar section.
- Paste this code into your wiki to embed your calendar (from [google.com](http://google.com)).

In social studies, homework is uploaded either as text or as a voice recording using Vocaroo (<http://vocaroo.com>). Emily listens to the Vocaroo voice recording embedded in the class wiki. She finds this extremely useful; her teacher adds specific details to help her better understand the assignment and what she is expected to do.

To provide ongoing repetition and review, Emily's math teacher decides to create math casts by recording math instruction using the Pulse SmartPen by Livescribe (<http://livescribe.com>). This computerized pen records and

links audio to what she writes. Then, the video with audio is uploaded to a computer and posted online to allow for review of the instruction as often as needed. Emily accesses the class website and watches the mathcast recorded that day with the Livescribe Smart Pen. She is grateful that she has the opportunity to review the instruction again. She understood it at school, but needs the review once she is home, ready to begin her math homework.

In biology, a student uses a Smartphone to take a photo of the homework assignment written on the board and emails it to the class email list. Uploading homework in this manner limits the amount of paper for which Emily is responsible. Over time, Emily will learn to access the school websites or class wikis independently to retrieve homework tasks.

All teachers upload assignment documents to the class website or wiki for retrieval in any environment—the school or public library, the classroom, or at home. Emily is encouraged to complete the assignment on the computer and email it to the teacher immediately following completion.

Uploading assignments in this manner and allowing Emily to email the completed assignment directly to the teacher reduces the amount of paper for which Emily is responsible. The use of paper has been identified as a significant obstacle for her.

With these external supports in place and with the use of the Livescribe SmartPen, Emily experiences greater success with managing her workload. Next, we will look at individual strategy supports that will help equip her for success once she graduates.

### Individual Strategy Supports

Emily uses color-coded folders with side pockets for each academic subject. When she is given worksheets, she places them in the appropriate folder. She uses the left pocket for papers she must complete and the right pocket for papers ready to be passed in at the beginning of class. Throughout the school year, teachers will be moving to a paperless environment and this method will become unnecessary.

Emily uses a to-do app with a checklist on her cell phone. She is able to check off each assignment as she completes it. There are numerous app options found in the “productivity” category on iOS or Droid devices.

Emily uses the timer on her cell phone to track how much time it takes her to complete the assignment. She is working on time management skills, and this helps her track her time. She also sets alarms throughout her day to give herself audio reminders to remain focused. An additional method Emily explores with her academic support teacher is TimeTracker ([www.formassembly.com/time-tracker/](http://www.formassembly.com/time-tracker/))

to identify how long specific tasks take to complete. This information is extremely helpful, since she typically underestimates how much time is required to complete schoolwork.

Her study skills teacher introduces TrackClass (<http://trackclass.com>), a free online student organization tool. Together they develop a plan to explore and implement specific features to determine which ones support Emily’s learning style. TrackClass offers many features, including one location for recording and tracking all assignments, a calendar view, reminders, and the ability to upload files. After each feature is introduced, Emily uses it for two weeks and determines whether she believes it is of benefit. Once all features are explored, Emily will decide which features help her and how to continue to use them. She will add tools to her toolkit if she achieves success.

Emily is well positioned to improve her organizational skills. External supports, combined with explicit strategy instruction and tool use, are necessary for her to increase her independence.

### Summary

It is hoped that this article stimulates thinking in new ways. The Read/Write Web offers unique opportunities to support students with executive skill deficits while promoting

academic success and engagement. Recommended implementations include both external environmental supports and explicit strategy instruction.

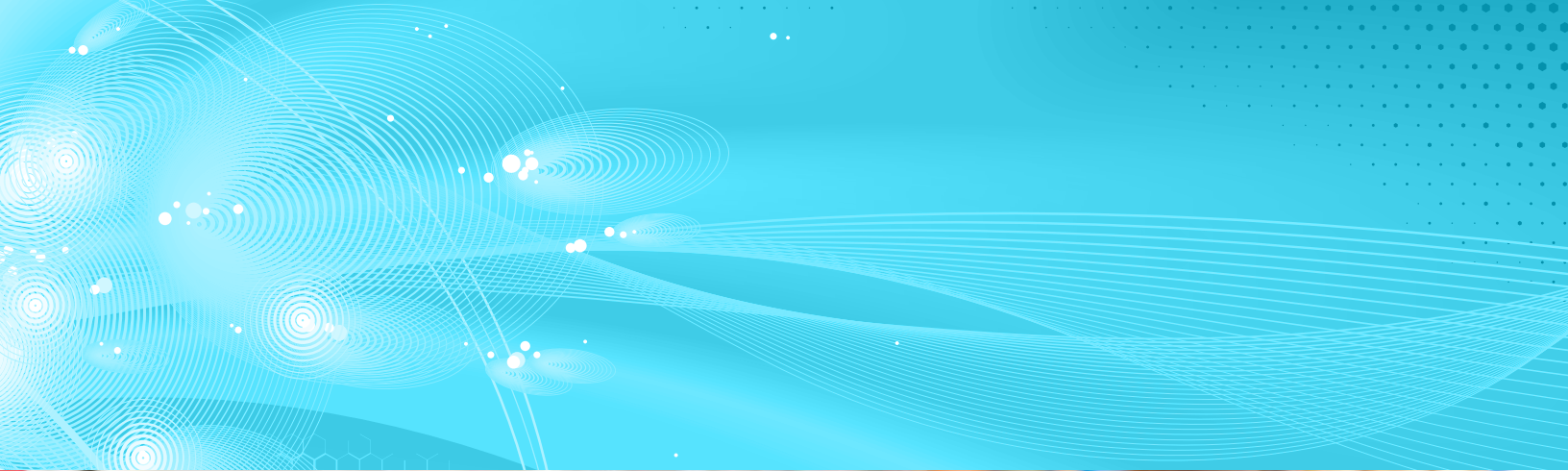
Educators should ensure that students are equipped and empowered for life beyond our classroom. Teaching students about the technology options available that promote success is an excellent approach.

### References

- Dawson, P., & Guare, R. (2004). *Executive skills in children and adolescents: A practical guide to assessment and intervention*. New York: Guilford Press.
- Horowitz, S. H. (2007, March 1). *Executive functioning and learning disabilities*. Retrieved from [www.ncl.org/ld-basics/ld-aamp-executive-functioning/basic-ef-facts/executive-functioning-and-learning-disabilities/](http://www.ncl.org/ld-basics/ld-aamp-executive-functioning/basic-ef-facts/executive-functioning-and-learning-disabilities/)
- Reynolds, C. R., & MacNeill, H. A. Jr. (2008). Assessing executive functions: A life-span perspective. *Psychology in the Schools*, 45(9), 875-892.
- St Clair-Thompson, H. L., & Gathercole, S. E. (2006). Executive functions and achievements in school: Shifting, updating, inhibition, and working memory. *Quarterly Journal of Experimental Psychology*, 59(4), 745-759.







**Technology and Media Division  
of the Council for Exceptional Children  
[www.tamcec.org](http://www.tamcec.org)**